The progress of the intellect is to the clearer vision of causes, which neglects surface differences.

Every chemical substance, every plant, every animal in its growth, teaches the unity of cause, the variety of appearance.

—Emerson

Familial Nonreaginic
FOOD-ALLERGY

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TO

ELLA F. GROVE

skillful collaborator, wise counsellor,
friend to all in need,
my admired wife

Introduction

THE CURRENTLY orthodox concept of the pathogenesis of allergic disease is that of von Pirquet and Schick.[1] In its elementary form this theory stated that antigen and antibody, in their mutual reaction in or upon a susceptible tissue, may irritate that tissue, thus causing the injurious effects that are revealed in allergic symptoms.

The theory of von Pirquet and Schick has been fully realized in only two of the several known categories of allergic disease that are described in the next chapter; that is, in the atopic category and in serum sickness. Only in these two categories have antibodies been identified with certainty as the specific cause of the allergic phenomena, and it seems most probable that the antibodies in the two categories, that is, the atopic reagins and the antibodies of serum disease (Karelitz[2]), are qualitatively different from each other and that both are different from precipitin.

In the three other categories (contact dermatitis, allergy of infection and familial nonreaginic food-allergy) the hypothetical antibodies postulated by the theory have not been demonstrated and the search for them is somewhat discouraged by the circumstance that some of the excitants of these allergic conditions are not antigenic, for example, metals, alkaloids and synthetic chemicals. Nevertheless, the assumption of antibody-like substances as the specific mechanism of all allergic disease seemed justified by the *specificity* of the allergic reactions.

However, recent observations, which are discussed in this edition (Chapter XIX), have indicated that antibodies, as we know them, can have no part in the specific reactions of the fifth category of allergic disease, idioblapsis.

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[1] von Pirquet and Schick: *Die Serumkrankheit* Deuticke, Leipzig & Wien, 1905
[2] Karelitz, S and Stempien, S S. *J. Immunol*, 44:271, 1942
Karelitz, S: *J Immunol*, 44:285, 1942
Karelitz, S and Glorig, A *J Immunol*, 47:121, 1943

Preface to the Third Edition

KNOWLEDGE OF THE theory and practical use of the principles of idioblaptic allergy has been substantially extended since the publication of the second edition of this monograph.

Eight items seem worthy of special mention:

1. The effective control of allergenic house-dust with Dust-Seal, a product devised by Leonard S. Green.
2. The diagnostic and prognostic use of the stellate ganglion block.
3. Locke's demonstration of the predispositional relation of idioblaptic allergy to poliomyelitic paralysis.
4. Milo G Meyer's report; including his 24 cases of hypertension, and his two cases of multiple sclerosis, since increased to 13 and fortified by the later cases of Alan Johnston and the writer.
5. The reports on the high incidence of tobacco-sensitivity by the writer and that by Granville F. Knight.
6. The demonstration that idioblaptic allergy does not depend on an antigen-antibody mechanism.
7. The report of Conrad Berens and his associates on Allergy in Glaucoma, studied with the pulse-diet method.
8. The adoption of the routine plan of a series of single-food tests at 1 or 1½ hour intervals through the day.
9. The message to gynecologists and pediatricians in the report by Alan Johnston and the author; "Concerning the Special Problems of Idioblaptic Disease as It Affects Women."
10. John H. Irwin's description of his simplified technic in "Conservative Sympathectomy as an Antiallergic Measure," (Medical Record, Vol. 163, Dec., 1950).

Among those who have mastered the now fully developed pulse-dietary procedure, the impression grows that it cannot well be fitted into the heavy program of the practicing physician.

Its proper personal application to one or two patients may require the almost constant presence of the physician in his office for most of one or two days.

On the other hand it is easily possible to train nonmedical college-graduated nurses in the art of pulse-dietary interpretation. With the assistance of a sufficient staff of such personnel a few experienced medical specialists could organize a service which would accommodate a relatively large number of patients at a cost within the reach of practically all working people.

The establishment of such a diagnostic center with adequate facilities for the usual clinical laboratory examinations will greatly advance the cause of the new preventive medicine.

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Oradell, New Jersey

Preface to the Second Edition

In the preface of a publication an author is permitted, by custom, to intrude his more personal thoughts.

For taking advantage of that custom in this second edition I plead a considerable provocation at the hands of many personal acquaintances among experienced allergists and other medical specialists, from whom I could reasonably expect at least an unprejudiced hearing, if not a generous coöperation.

The attitude of most of these towards the first edition of this monograph has been that of a skepticism so uncompromising that I have not even been invited to demonstrate the new method of examination described therein.

It is quite out of the question to attribute this attitude to any personal prejudice; no, the reason for it is that the medical profession is again faced with scientific findings and their consequences that are so far out of line with settled concepts as apparently to represent the impossible.

The following preliminary conclusions drawn from my own study and the reports of Locke and of Price will illustrate the wide divergence of these findings from accepted medical dogma:

1. The level and range of the normal pulse-rate is a physiological constant in each individual, varying widely in *different* individuals.

2. The most common cause of variations in the individual from this normal constant is familial nonreaginic food-allergy (idioblapsis).

3. Upwards of 80 per cent of the white population are hereditarily affected with idioblaptic allergy.

4. Idioblapsis is probably a lethal character; the most important primary cause of a noninfectious disease, and a predisposing cause of some infectious disease.

These four major conclusions are of a sufficiently revolutionary nature to explain the hesitation of experienced medical specialists

to waste much time with the described method of diagnosis and *treatment. A few tell me that they have tried it unsuccessfully* but only two* have seriously asked me to help them with their difficulties in its use, much as I should like to do so.

However, I know that an interest in this matter is stirring here and there and confirmation of the fundamental facts is already beginning to appear.

A. F. Coca, M.D.

Pearl River, New York

* One of these was the late Warren T. Vaughan, who sent me a beautifully complete pulse-diet record, from which it could be seen that the patient was intermittently exposed to an environmental pulse-accelerating allergen

Preface to the First Edition

There is a large body of published clinical evidence contributed by many observers and much more unpublished observation that points to an allergic nature of many clinical symptoms and syndromes, some of which are thought to be independent pathological entities. Such interpretation has been impressed upon the thought of these numerous professional and lay observers by the repeated association of the symptoms with the eating of particular foods that were ordinarily taken at relatively long intervals of time. In some instances the belief in this causal relationship has been supported by the demonstration of a cutaneous sensitivity to the incriminated foods in the affected persons.

But the very acceptance of this last point of evidence as supporting the allergic theory with respect to the few cases in whom specific cutaneous sensitivity could be shown has actually served to prevent the acceptance of the theory with respect to the much larger group of clinically identical cases in whom the cutaneous tests have failed to support it.

Fortunately, the new diagnostic method described in this report provides a highly accurate, practical means of identifying the excitants of food-allergy and thus enables us at last to determine which symptoms and syndromes are food-allergic.

A. F. Coca, M.D.

Pearl River, New York

Contents

CHAPTER I

Classification of Allergic Disease

IN THIS BOOK, chief attention is paid to a certain category of allergic disease.

It may be helpful, therefore, to some readers who are not conversant with the classification of allergic diseases that is now generally recognized, if this is briefly set forth at the outset.

Five categories of allergic disease are distinguishable:

(1) *Atopy* This group comprises bronchial asthma, hay-fever, and the condition sometimes called infantile eczema (atopic dermatitis), which are subject to a common hereditary cause. It is, indeed, this hereditary character of these clinical conditions which unites them in one group, and separates them from the other categories.

Many of the subjects of these atopic conditions exhibit another quality, which is lacking in the other four categories, namely, the presence of demonstrable allergic antibodies, "atopic reagins," which are sometimes responsible for the clinical sensitivity of the atopic individual. The existence of these atopic antibodies, as differing qualitatively from all the classical antibodies, especially those referred to as precipitin, was first reported in 1925.[1] The differences first noted were the following: (1) Precipitin passively sensitizes the unstriped muscle of the guinea-pig but not the human skin, whereas atopic reagin sensitizes passively the human skin but not the guinea-pig's unstriped muscle; (2) mixtures of the atopic antibody with the related antigen show no visible precipitate, as is the case with similar mixtures of other antibodies with the respective antigen; nor does partial desensitization of atopically sensitive tissue by the specific antigen follow the law[2,3] controlling this process in the case of anaphylactically

[1] Coca, A F and Grove, E. F *J Immunol*, *10*:445, 1925
[2] Coca, A F and Kosakai, M. *J Immunol*, *5*:297, 1920
[3] Walzer, M and Grove, E F *J Immunol*, *10*:483, 1925

shock-organs is a fundamental concept in the understanding of idioblaptic allergy, with its countless "shock-organs," or shock localities, in all parts of the body.

The special abnormality of the atopic shock-organs just referred to is also seen in the fact that reagin-production has been demonstrated in ample quantity in the blood of children of atopic parents *before* the children themselves have begun to show atopic symptoms.[14a] Apparently, the local abnormality of the predestined atopic shock-organs in these children had not "matured."

The original definition of the term atopy, that is, a group of allergic diseases that are subject to a common hereditary influence, has been lost sight of by certain subsequent writers. Some have seen in it only another synonym for the broader term allergy. Vaughan, in his excellent book, *Practice of Allergy* (p. 37), quotes me as having proposed the term "to designate what are commonly known as the clinical allergies, in which reagins can be demonstrated." I did not originally limit the term in this way. *Actually*, the atopic reagins were not known when the term atopy was first proposed. Nevertheless, the new facts that have been brought to light in the present investigation have forced the *adoption* of Vaughan's amendment and the definition of atopy now becomes "a group of allergic diseases that are subject to a common hereditary influence and in which the atopic reagins are often demonstrable"

Atopic reagins are not always demonstrable in atopic disease. M Walzer[14] writes:

> The riddle as to the etiology of the asthma in an individual is not always answered by skin testing There remains, possibly, one-third of all cases who do not exhibit any positive cutaneous reactions, in addition to which may be added a considerable number *in whom such reactions do not* comply with Cooke's postulates or do not completely explain the patient's symptoms.

According to Walzer,[15] approximately the same proportion of the patients with atopic dermatitis lack demonstrable atopic reagins, or at least obtain no clinical benefits from positive findings in this respect.

[14a] Baldwin, L. B *J Immunol*, *15* 315, 1927.
[14] Coca, Walzer and Thommen. *Asthma and Hayfever*, Springfield, Illinois, Charles C Thomas, Publisher
[15] Walzer, M. Personal communication

sensitive unstriped muscle of the guinea pig; (3) the atopic antibodies are much more susceptible to heat than are the classical antibodies.[4,5]

Other differentiating peculiarities of the atopic antibodies are: (4) The easy reversibility of their specific union with the related antigen as shown by their inability to inactivate the latter.[5,6,14] A mixture of pollen-extract or extract of rabbit-dander with the respective atopic serum causes the same reaction in a sensitive skin as a mixture of the extract with the same volume of saline solution.[6] (5) Mixtures of egg-white with precipitating immune serum versus egg-white from a nonatopic child who has had parenteral contact with egg, fix complement permanently in a quantitative zone of the antigen ranging between 1–30 and 1–100,000, whereas, with the serum of a highly egg-sensitive child, the fixation is only transient and in a zone of characteristically much higher antigenic dilutions, 1–240,000 to 1–10,000,000.[7,8] (6) The atopic antibodies possess a high affinity for human fixed tissues,[9,10,11,12] which is lacking in the classical antibodies.[13]

A third important feature of the atopic illness is the independence of its organic localizations. Thus, although the atopic sensitivity in two individuals may be mediated by atopic reagins specific for the same excitant, the clinical symptom in one may be asthma, in the other rhinitis. This fact alone suggests that these so-called "shock-organs" possess some abnormality other than their quota of allergic antibodies; this assumption is needed to account for their evidently independent susceptibility to the antibody-antigen reaction that takes place equally on both organs in the two individuals.

This principle of the independent susceptibility of the allergic

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[4] Coca, A. F. and Grove, E. F.: *J Immunol*, *10*:445, 1925
[5] Loveless, M. H: *J Immunol*, *38*:25, 1940
[6] Levine, P. and Coca, A. F. *J Immunol*, *11*:411, 1926.
[7] György, Moro, and Witebsky: *Klin Wchnschr*, *9* 1012, 1930
[8] Katzin, E., cited by Coca, A. F.. *Ergeb d. Hyg. u. s. w*, *14*:538, 1933
[9] Coca, A. F. and Grove, E F: *J. Immunol*, *10*:445, 1925.
[10] Gay, L. N. and Chant, E: *Bull Johns Hopkins Hosp.*, *40*:270, 1927.
[11] Bell, S. D. and Eriksson, Z. *J Immunol*, *20*:447, 1931.
[12] London, McKinley: *J. Allergy*, *12*:244, 1941.
[13] Freund, J.: *J. Immunol*, *16*:515, 1929.
[14] Reddin, L., Jr.: *Am J. Vet Res*, *6*:60, 1945.

third kind of antibody, which functions as the specific mechanism in serum-sickness; the experimental results seem conclusively to rule out both precipitin and the atopic reagin.

(4) *Contact dermatitis.* This category of allergic disease is typically illustrated in dermatitis caused by poison ivy. The numerous excitants of this clinical condition are all nonantigens, no proteic excitant of it having been encountered. However, it should be mentioned here that the cutaneous reaction in tuberculous persons to the "tuberculin patch-test" resembles, at least closely, the lesion of contact dermatitis.

No antibodies responsible for the specific sensitivity of contact dermatitis have been found. The sensitivity seems to develop in[24] and to be limited to the epidermal cells, hence the intracutaneous test with the excitant results negatively.

A lessened clinical sensitivity can be brought about by injections of solutions of the extracted oily excitant of ivy dermatitis, and Bedford Shelmire[25] has reported that a demonstrable insensitiveness can be induced in the most sensitive subjects by having them take increasing quantities of the poison-ivy extract by mouth.

(5) *Idioblapsis; familial nonreaginic food-allergy.* The findings of the investigation that was reported in the first edition of this book have made it seem necessary to recognize the fifth category of familial allergic disease which differs in five important respects from the atopic category: (1) The hereditary influence controlling its occurrence is independent of the atopic inheritance; (2) allergic antibodies ("reagins") are not demonstrable; (3) many of the symptoms are not represented in the atopic group; (4) the allergic reaction practically always causes acceleration of the pulse, (5) the specificity of the individual sensitivities can not be attributable to humoral antibodies, but is a property of the sympathetic nervous system.

Previous to the first announcement of the fifth category of allergic disease it was necessary to decide upon an inclusive term for its designation. Upon the advice of a small group of allergists I offered the expression "familial nonreaginic food-allergy."

[24] Straus, H and Coca, A F, *J Immunol*, 33:215, 1937.
[25] Shelmire, Bedford *J Allergy*, 12:252, 1941

(2) *Allergy of infection.* This allergic state is typified by the sensitivity to tuberculin. It occurs in a number of other infections, such as those of *B. mallei, B. melitensis,* the pathogenic fungi, the viruses, and others.

Among the several features of allergy of infection that distinguish it from the atopic group may be mentioned (a) the lack of a familial character, the sensitivity being established merely by the infection; (b) the absence of demonstrable antibodies* as a specific mechanism of the sensitivity; (c) the inflammatory character of the reaction, as contrasted with the congestive-edematous nature of the atopic lesion.

(3) *Serum-disease.* This well-known clinical entity, which needs no detailed description here, has been regarded by many as the clearest example of anaphylactic sensitivity in man; that is, a specific reaction due to the development of precipitating (anaphylactic) antibodies under the antigenic stimulation of the injected foreign serum. Among several obstacles preventing the acceptance of this plausible theory are: (a) After the injection into normal human subjects of *normal* horse-serum, which causes typical serum-disease, production of antibody is either slight or cannot be demonstrated at all.[17] (b) Drug-allergy, which is excited by nonantigenic substances, frequently has exhibited the characteristic features of serum-disease: incubationary period, eruption, pyrexia.

Serum-disease appears in over 90 per cent of persons receiving unrefined horse-serum intravenously in sufficient quantity. It affects some lower animals (rabbits, horses, cattle, monkeys.[18, 19, 20, 21, 22]

The experiments of S. Karelitz[23] *reveal the existence of a*

* The recently reported passive transfer of generalized tuberculin-sensitivity by Merrill Chase through intracutaneous injection of the leucocytes of tuberculin-sensitive individuals revives interest in this question.

17 Tuft, L and Ramsdell, S G : *J. Exper Med*, *50* 431, 1929

18 Fleisher, M. S and Jones, L *J Exper Med*, *54*.597, 1931

19 Jones, L. and Fleisher, M S . *J Exper Med*, *55*:79, 1932.

20 Zinsser, H : *Proc Soc Exper Biol & Med*, *18*:57, 1920.

21 Gerlach, F.: *Ztschr. f Immunitätsf.*, *34*.75, 1922.

22 Kopeloff, N., *et al* : *J Immunol*, *36*:83, 101 (Lit), 1939

23 Karelitz, S. and Stempien, S S . *J. Immunol*, *44* 271, 1942 Karelitz, S *J. Immunol.*, *44*:285, 1942 Karelitz, S. and Glorig, A . *J Immunol*, *47* 121, 1943 Karelitz, S.: *Ann New York Acad Sc*, *50* 705, 1949

have closed their minds to the existence of most of these conditions as symptoms of food-allergy; certainly they do not realize their high incidence among the population, notwithstanding the several publications on this important matter.

Rowe, in his well-known book on *Food Allergy* (1931), reported a probable incidence of food-allergy of 35 per cent among 400 university students, and in the same year Vaughan,[26] in his survey in Clover, Virginia, independently arrived at an incidence of "minor food allergies" of approximately 50 per cent in addition to "upward of 10 per cent developing major allergic manifestations—those which occur frequently on account of sensitization to a food with which he comes into frequent or daily contact. . ." Vaughan's total incidence was thus 60 per cent. Pipes,[27] in a survey of 700 individuals in Jackson, Louisiana, has reported a total incidence of 50 per cent.

TABLE I

Showing the occurrence of atopy among 191 food-allergic persons and 69 persons free of food-allergy

Familial nonreaginic food-allergy	191 (74 5%)	Atopy	11 (5 7%)
No food-allergy	69† (25 5%)	Atopy	4 (5 7%)
Total	260 (100 00%)	Atopy	15 (5 7%)*

Patients who have been under the dietary treatment for nonreaginic food-allergy are not included in this survey The individuals making up the group were taken at random among residents in a suburban town (Oradell, New Jersey) and among nurses in the nearby Hackensack hospital.

* No doubt the smallness of this percentile incidence of atopy is due to the fact that the group is composed largely of children and young adults

† This unusually high percentage of allergy-free persons can be reasonably explained, in part at least, by the following circumstance A considerable proportion of the entire group was made up of student nurses in the Hackensack hospital The physical requirements for admission to the nursing school in that institution are high. Hence, it is possible that the selected group of the candidates was composed of a disproportionately large percentage of nonallergic persons

In a survey which I conducted by questioning of 825 adults, 12 per cent were found to be insusceptible to common cold. This cold-free group was found to comprise all the nonallergic individuals (8.5 per cent and the mildly allergic ones or allergic persons who controlled their allergy by avoidance (3.5 per cent).

[26] Vaughan, W. T *J Allergy*, 5 184, 1934.
[27] Pipes, D M *Southern M J*, 30·1012, 1937

That expression was not satisfactory because the excitants of the condition may be drugs, or metals, or inhaled fumes or dusts. This objection, to be sure, could be met by taking out the word "food." However, it seemed practically advantageous to leave that word in thus emphasizing the importance of the primary dietary survey.

It became evident that a new distinctive term was needed to designate the newly defined category of allergic disease. Having obtained the advice of Dr. Perry, professor of Greek in Columbia University, regarding the designation of the atopic category, I took the present problem to his successor, Professor Kurt von Fritz.

Since a general concept of the category seemed more appropriate and more practical for the purpose than any specific one, I suggested "life-spoiler," having in mind the fact that most of the misery of human existence is due to it, and disregarding the fact that it causes premature death in most affected persons.

Professor von Fritz pointed out that the Greek word *βλαπσιs* means spoiler or damager and that the compound word "bioblapsis" would convey the concept mentioned above.

I sent Professor von Fritz's suggestion to Sanford B. Hooker in Boston, asking for his reaction. Dr. Hooker consulted Professor C. B. Gulick of Harvard University, who agreed in general with Professor von Fritz but, in response to Dr. Hooker's proposal to "indicate individual peculiarity" in the term, suggested "idioblapsis," "idioblaptic," etc.

Professor von Fritz approved this form and I proposed its adoption. The strangeness of the term is apparent, yet that very quality seems appropriate to its tragic significance.

Previous to the present study, the clinical conditions listed as those of idioblapsis had not been shown to be subject to a familial influence, which heretofore has been demonstrated only in hay-fever, perennial specific coryza, asthma and atopic dermatitis; that is, the group of atopy. The manifestations of idioblapsis have been relatively neglected by allergists, perhaps because of the general failure of the cutaneous tests in their diagnosis and the unsatisfactory results of the usual trial diets in most cases. One may be tempted to say that most allergists

TABLE II

Results of cutaneous tests in 32 subjects of familial nonreaginic food-allergy. Figures indicate the number of different foods used in the tests; all of those foods had caused tachycardia in the respective person

Patient	Direct Intracutaneous Tests	Indirect Tests in a Substitute
E F. C.	—	Negative (3)
A F. C	—	Negative (8)
M M. D (asthma and hay-fever)	Negative (4) Positive (1)	
C T	Negative (5)	Negative (4)
J. G.	Negative (2)	
A R.	Negative (1)	
L R	Negative (3)	
S H	—	Negative (3)
W W F	—	Negative (2)
M F.	—	Negative (3)
M A.	—	Negative (6)
P W	—	Negative (4)
E B.	Negative (2)	
C B (asthma)	Negative (2) Positive (2)	
R M	Negative (5)	
J J V (asthma)	Negative (9) Positive (3)	
J K	Negative (11)	
J F	Negative (8)	
W S C	Negative (3)	
J V	Negative (13)	
M N	Negative (4)	
R. F	Negative (7)	
N. vW	Negative (9)	
L H B	Negative (21)	
Mrs E B	Negative (6)	
A S	Negative (15)	
M S	Negative (6)	
W G	Negative (2) Neg.-sl. (1) not passively Slight (1) transferable	
M P, age 11 (grandmother, G B, asthmatic)	Negative (6) Positive (1 and dust)	
G B (asthma)	Negative (3)	
E K	Negative (2)	
G H	Negative (16)	

In some patients tests were not made with some of the known allergenic foods. Negative tests with nonallergenic foods are not included

since the first report of the discrepancies, those results have always been confirmed. Indeed, it should hardly be necessary to remind the reader that positive cutaneous reactions with food extracts in

In this indirect manner it could be estimated that at least 90 per cent of that population were "food-allergic."

Locke, in a study of 643 college-girls and 798 parents found 79 per cent showing two or more allergic symptoms and an additional 15 per cent reporting one symptom. This result of a very carefully conducted survey also indicates an incidence of at least 90 per cent. And this estimate has since been confirmed in Locke's investigation of poliomyelitis in Minneapolis.

This high incidence of the clinical conditions now recognized as nonreaginic food-allergy stands in significant contrast with the known low occurrence (7–10 per cent) of atopy. The genetic independence of these two categories is indicated, also, in the fact that the incidence of atopy seems not to be significantly greater among nonreaginically food-allergic persons than it is among those free of nonreaginic food-allergy (see Table I).

The preliminary evidence pointing to a genetic independence of the two categories of allergic illnesses has just been described. These two categories must differ also in their specific mechanism, because atopic reagins are regularly absent in the category in which the specific reactions to foods are accompanied by an acceleration of the pulse.

The Absence of "Atopic Reagins" in Idioblaptic Allergy

The absence of the peculiar allergic antibodies of the reaginic group is an outstanding mark of differentiation of the newly recognized category of allergic disease. In the descriptions of the five cases, M. M. D., A. R., J. G., L. R. and C. T. in the first edition of this book, negative direct tests, confirmed in some instances with negative indirect tests (Walzer method), were recorded with 14 individual extracts. The results of direct tests (in the patients) and, in a few cases, indirect tests (in a receptive substitute) in these five cases and 27 additional cases are presented in Table II.

It is seen that with these tests reaginic sensitivity to foods could be demonstrated in four patients who either exhibit the atopic symptoms of asthma or hay-fever or have asthmatic ancestry, but not in any of the other 28 food-allergic patients.

In the many similar comparative tests that I have carried out

CHAPTER II

Practical Management of Idioblaptic Allergy

Diagnosis

Under this heading three major questions must be considered, namely,

1. Is the patient a person of food-allergic constitution?
2. Can the chief symptom or symptoms complained of be identified as food-allergic, or is the patient predisposed to them by the handicap of food-allergic pathology?
3. What are the specific excitants of the food-allergic symptoms in the particular case?

1. *Is the patient a person of food-allergic constitution?*

This question can be answered through two kinds of inquiry; the first concerns the possible existence of recognized food-allergic symptoms, the other concerns the character of the pulse-rate. The results of these two inquiries convey a somewhat different diagnostic significance and taken together they provide, in practically all cases, a dependable answer to the question.

The first inquiry can be carried out with the use of the questionnaire on page 14 (Table III). The data should include not only the existing food-allergic symptoms but also those that have been experienced by the patient at any previous time. For example, many persons have suffered attacks of *urticaria* in early life but not at any later period; headaches, canker-sores, neuralgia occur in some food-allergic persons infrequently and may be absent at the time of the consultation.

Any one of the first 11 symptoms listed in the questionnaire is indicative of the food-allergic constitution, provided that the rela-

chronic urticaria, constipation, neuralgia, abnormal tiredness and the other more common idioblaptic symptoms, not to mention ulcer and hypertension, are notoriously conspicuous by their rarity; whereas the specific excitants of all of these manifestations can be identified with the criterion of specific tachycardia.

There can be no doubt that the acceleration of the pulse-rate following the ingestion of an allergenic food is directly or indirectly specific. This principle being accepted, it must be significant that, in 32 food-allergic persons who have been found, by the objective criterion of the tachycardia, as well as by the accompanying clinical symptoms, to be specifically sensitive to a total of 200 different foods, blood-borne reagins could not be demonstrated for any of these foods.

It is these observations that seem to call for the assumption of some specific mechanism other than the atopic reagins in the causation of idioblapsis.

There are published reports by W. T. Vaughan[28–32] of positive cutaneous reactions to foods occurring in subjects of migraine. In some of these persons the avoidance of the indicated foods was followed by the disappearance of the migraine.

Vaughan's observations gave the first certain evidence of the food-allergic nature of migraine, yet it can now be seen that his success was really due to the coincidental presence, in his "cured" patients, of atopic disease and idioblapsis, both of which, as it happened, were excited by the same foods. Vaughan's observations have been confirmed by Rowe,[33] Rowe and Richet,[34] Eyermann,[35] Balyeat,[36] and Beecher.[37] However, the following statement, which appears in Rowe's paper, is especially noteworthy:

> In brief, *certain* patients are relieved by the exclusion of those foods to which positive skin reactions or a history of definite food idiosyncrasies exist. However, *most adult patients fail to give satisfactory skin reactions to allergenic foods* . . . . (Italics are mine.)

[28] Vaughan, W. T.: *J. A. M. A.*, *88*:1383, 1927.
[29] Vaughan, W. T.: *Am. J. M. Sc.*, *185*:821, 1933.
[30] Vaughan, W. T.: *Lancet*, *56*:127, 1936.
[31] Vaughan, W. T.: *Southern M. J.*, *28*:267, 1935.
[32] Vaughan, W. T.: *J. Allergy*, *6*:365, 1935.
[33] Rowe, A. H.: *J. A. M. A.*, *99*:912, 1932.
[34] Rowe, A. H. and Richet, C., Jr.: *J. Med. Francais*, *19*:170, 1930.
[35] Eyermann, C. H.: *J. Allergy*, *2*:106, 1931.
[36] Balyeat, R. M. and Brittain, F. L.: *Am. J. M. Sc.*, *80*:212, 1930.
[37] Beecher, W. L.: *Illinois M. J.*, *55*:123, 1929.

CHAPTER II

Practical Management of Idioblaptic Allergy

Diagnosis

Under this heading three major questions must be considered; namely,

1. Is the patient a person of food-allergic constitution?
2. Can the chief symptom or symptoms complained of be identified as food-allergic, or is the patient predisposed to them by the handicap of food-allergic pathology?
3. What are the specific excitants of the food-allergic symptoms in the particular case?

1. Is the patient a person of food-allergic constitution?

This question can be answered through two kinds of inquiry; the first concerns the possible existence of *recognized* food-allergic symptoms, the other concerns the character of the pulse-rate. The results of these two inquiries convey a somewhat different diagnostic significance and taken together they provide, in practically all cases, a dependable answer to the question.

The first inquiry can be carried out with the use of the questionnaire on page 14 (Table III). The data should include not only the existing food-allergic symptoms but also those that have been experienced by the patient at any previous time. For example, many persons have suffered attacks of urticaria in early life but not at any later period; headaches, canker-sores, neuralgia occur in some food-allergic persons infrequently and may be absent at the time of the consultation.

Any one of the first 11 symptoms listed in the questionnaire is indicative of the food-allergic constitution, provided that the rela-

tively infrequent nonallergic causes* of them have been carefully excluded. However, the certainty of the existence of the food-allergic character in the individual increases with the *number* of the symptoms present. (See Chapter XVI, Table XXIII, Locke's observations.)

Support for the conclusion arrived at through this means can often be obtained by extending the inquiry to the near relatives, parents, brothers and sisters. If the food-allergic character is

TABLE III

Age. Blood pressure. *Do you smoke?* *Colds?*	SELF	FATHER	MOTHER	BROTHER OR SISTER			CHILDREN		
HIVES									
HEADACHES									
HEARTBURN									
INDIGESTION									
CANKER-SORES IN MOUTH									
DIZZINESS									
CONSTIPATION									
NERVOUSNESS									
NEURALGIA									
CHRONIC RHINITIS									
ABNORMAL TIREDNESS									
HAY-FEVER									
ASTHMA									
HEMORRHOID									

NAME . DATE

Of the listed symptoms the first 11 are the most frequently encountered symptoms of food-allergy. The original questionnaire did not include constipation and chronic rhinitis ("sinusitis")

present in both parents, *all of the children seem at least likely* to be affected. Exact study of this question is needed.

The second inquiry (*that concerning the individual pulse-character*) yields information that has served nearly always as a dependable criterion of the presence of the food-allergic state.†

* Severe headache, nausea, vomiting, abdominal pain and dizziness, while they are usually food-allergic, may be due to other conditions such as brain tumor, infection, malignant tumor, anemia, and others.

† By the "food-allergic state" is meant here the condition of present physiological reaction to an idioblaptic allergen

In the later discussion of the normal adult pulse-rate (Chapter XIII) it will be shown that this function of the heart is one of the most dependable, human, physiological constants. In the present connection its significant characters are the following two:

a) The daily range from low to high is rarely greater than 16 beats per minute.
b) The daily maximum does not vary more than two beats per minute.

If, then, the daily range of the pulse-rate exceeds 20 and if the daily maximal counts per minute vary more than two beats, the patient is practically certainly affected with idioblaptic allergy If, furthermore, the maximal count is 88 or higher, this is corroborative evidence, and the diagnosis can be upheld even in the absence of all of the other eleven common food-allergic symptoms.

Rarely the food-allergic patient may present a completely normal pulse-record for several days on an unrestricted diet—a somewhat disturbing experience when first encountered.

This happened in the case of L. A. C., whose chief complaints were frequent colds and constipation, although there existed also a hypertension (230/134). On the first two days, on his regular diet, the patient ate nine different groups of food, exhibiting normal pulse-rates ranging from 56 to 66. The explanation of this very unusual occurrence was simply that on those two days by chance he had not eaten any of the few foods to which he was allergic at the time.

2. *Can the chief symptom or symptoms complained of be identified as food-allergic, or is the patient predisposed to them by the handicap of food-allergic pathology?*

The most common 11 symptoms of food-allergy have already been referred to (*Table III*) and a number of other symptoms that have been seen to disappear after all allergenic excitants have been removed from the food and environment of the affected persons are listed in Tables IX and X (see pp. 68, 69).

It seems probable that other symptoms of obscure etiology will prove to be food-allergic; hence, the experienced diagnostician of food-allergic conditions is certain to be confronted with occasional patients in whom the pulse-controlled dietary

regime must be experimentally applied before the symptoms chiefly complained of have been identified as food-allergic. No matter how such an experiment may turn out, the patient will benefit, with the termination of his present food-allergic symptoms, by the prevention of the later development of the common allergic symptoms of old age (neuralgia, arthritis, hypertension) and, if the chief complaint persists, by the elimination of food-allergy from consideration as a possible cause of it.

3. *What are the specific excitants of the idioblaptic symptoms in the particular case?*

The simplest answer to this question would seem to be "Those substances that cause a specific acceleration of the pulse." However, it is necessary to modify this statement somewhat. In the later discussion of the phenomenon of the major and minor allergens it will be seen that so long as the patient is exposed to the action of the major allergens he many suffer no symptoms from exposure to the minor allergens. Evidently, then, the diagnostician must consider the *potential* excitants as well as the actual ones. Rarely, also, the sensitivity to a particular allergen has been found to be so slight that the eating of it caused only a mild acceleration of the pulse, clinical symptoms being entirely absent. There is no evidence yet that allergic tachycardia *per se* results in any serious injury even if it persists for many years.

The practical procedure of identifying the specific excitants of an idioblaptic allergy consists in observing the pulse-rate just previous to and at three half-hour intervals after each meal and judging (one can often more appropriately say guessing) which foods cause tachycardia and which do not. This procedure has been modified and distinctly improved since the publication of the first edition of this monograph.

In the earliest experiments the logical, but usually unpractical plan, was followed of having the patient eat only one kind of food, usually milk, in the first day and adding, or changing to, a second food on the second day, depending on the course of the pulse-rate. The use of this plan was limited by the circumstance that about 30 per cent of food-allergic persons are sensitive to milk and the great majority of these are sensitive to several other important foods that lend themselves tolerably to the purpose (beef, cereals,

banana, pea-bean) and which naturally are among the first to be selected.

Recourse was then had to the daily five-small-meals plan, which was described in the first edition of this book. This plan was found, in most cases, to be satisfactory to the patient and well suited to its diagnostic purpose. However, the eating of *two* untested foods at one time too often resulted in difficulty of interpretation of the pulse-record, which is great enough without that avoidable complication. For this reason and notwithstanding some misgivings as to the psychological effect of the further restriction, the initial trial-dietary program was limited to *a single food at each "meal."* Happily, it was soon discovered that most persons harassed by severe allergic symptoms are willing to submit to the most drastic dietary restrictions for a reasonable time, if such measures offer a hope of relief.

It is usually advantageous to begin the survey by having the patient record the pulse counts through several days in which the customary three meals are taken, and the diet is unrestricted.

The preliminary observation of the pulse-rate on an unrestricted diet can be limited to a two-day period, which usually is ample time for the patient to accustom himself to the routine of the pulse-counts and to gain sufficient experience in accurate counting, as well as in the meticulous recording of the foods eaten, including the ingredients of such mixed foods as gravies, sauces, stuffing, salads, and drinks. The one offending ingredient of rice-pudding, for example, may be cinnamon.

In the preliminary period the patient should be advised to take a varied diet of the common foods, making reasonable changes from day to day and avoiding repetitions of the same meats as far as is practicable. Under these conditions the physician is sometimes able, from the record of the pulse-rate, to recognize a certain number of foods that are not allergenic in the particular case and certain others that probably must be avoided. This knowledge is helpful in that it allows the physician to initiate the trial-diet with a small list of foods instead of the usual succession of single foods.

It sometimes happens that one or more meals in the first few days contain none of the patient's allergens. If the pulse-reac-

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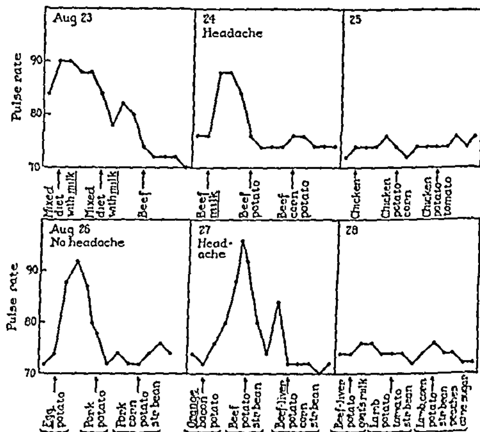
The preliminary observation of the pulse-rate on an unrestricted diet can be limited to a two-day period, which usually is ample time for the patient to accustom himself to the routine of the pulse-counts and to gain sufficient experience in accurate counting, as well as in the meticulous recording of the foods eaten, including the ingredients of such mixed foods as gravies, sauces, stuffing, salads, and drinks. The one offending ingredient of rice-pudding, for example, may be cinnamon.

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It sometimes happens that one or more meals in the first few days contain none of the patient's allergens. If the pulse-reac-

tion to meals containing some of his allergens is of only a few hours duration the pulse-counts may remain relatively low after the eating of the next allergen-free meals. The patient may then be instructed to limit his diet for a day to the items contained in those meals. If the pulse still remains low this confirms the ten-

CHART I



Reprinted from *Annals of Allergy, 3.8, 1945.*

tative interpretation that none of those foods is allergenic. An excellent illustration of this point is seen in the pulse-dietary record of Mrs. E. E., which is shown in Tables XIIa and XIIb, pages 98 and 99.

Chart I shows the graphic record of another easily solved case Dr. R., a long-time sufferer from sinusitis, migraine and abnormal fatigue, was unusually fortunate in the short period of his allergic

reactions; he was fortunate also in the small number of his food-allergens—cow's milk, egg and citrus fruit. By chance, these three were tested in the first five days; the subsequent avoidance of those foods was followed immediately by cessation of the headaches and the fatigue with a gradual and final healing of his infected sinusitis. So long as he avoids his food-allergens he remains free from colds.

Intracutaneous tests with the three foods caused no local reaction but they were followed one hour later by headache and moderate tachycardia.

The solution of a case of idioblaptic allergy is seldom as simple as it was in the instance just described. In much the greater number of cases there is a sensitivity to one or more foods that are eaten daily and at every meal (wheat, milk, egg, potato, meats). Hence there is never a lowering of the pulse-rate, or only one due to a tiring of the allergic mechanism that is concerned with the pulse.

In the routine survey it is customary to continue the pulse-counts on the daily three-meal schedule for only two or three days or, when time is limited, to omit this preliminary period entirely, proceeding immediately to the testing of single foods in small quantity at intervals of one and one-half hours or of just one hour.

The testing of single foods may begin at any time of day. If it begins after the lunch has been taken it is sometimes advantageous to have the patient either eat nothing the remainder of the day or to take a half glass of milk (preferably fresh goat's milk, if that is obtainable) three times at one hour intervals, counting the pulse every half hour. Goat's milk is preferred at this stage because it is much less allergenic than cow's milk. Wittich[1] states that he has not encountered a cow's-milk-allergic child that was also sensitive to goat's milk.

The early identification of a non-allergenic milk for the patient is especially useful if there is a sensitivity to many common foods. Milk is to most persons an agreeable, sustaining food which if it is not allergenic can be conveniently taken after an allergic reaction to some food until the tachycardia has subsided sufficiently to per-

[1] Wittich, F. W. Personal communication

mit resumption of the testing. Testing in the period of tachycardial reaction from a previous test is inadvisable for two opposite reasons; the high pulse-rate usually cannot be increased by a test with a second allergen, and on the other hand, it may remain high even if a nonallergenic food is taken. For these reasons it will be found time-saving, after a test with an allergen has been made, to suspend further testing until the reaction has subsided—having the patient stay his hunger in the meantime with nonallergenic foods.

Ordinarily whole days should be devoted to the series of tests of single foods in small quantities. The patient may select any single foods according to convenience, at first avoiding foods which he is sure disagree with him. The following schedules for two days are suggested by way of illustration:

FIRST DAY OF SINGLE-FOOD TESTS

A.M.		P.M.	
7:30	bread, 1/2 slice (no butter)	1:30	potato, small
9:00	milk, 1/2 glass	3:00	prunes, 2
10:30	orange, 1/2	4:30	sugar (tablespoon in water)
12:00	egg, 1 (boiled)	6:00	meat (beef or lamb)
		7:30	banana

SECOND DAY OF SINGLE-FOOD TESTS

A.M		P.M.	
7:30	corn (cereal)	1:30	peas
9:00	coffee (black)	3·00	tomato
10:30	beet or carrot (raw or boiled)	4:30	dates, 2–3
12:00	fish	6:00	meat (beef or lamb)
		7.30	apple 1/2

Salt may be used as desired with any foods, and water can be taken at any time. Otherwise, there must be *no additions* to the single foods mentioned. *Small portions* are advisable for two reasons, the more important being that the allergic reactions, if any, tend to recede sooner, making interpretation of the pulse-record easier. The other reason is that larger portions tend to dull the appetite for the succeeding tests.

Continuing the single-food tests on the third day, one may select several foods that seemed to have caused the least accelera-

tion of the pulse (if such a selection seems possible) and one may add some or all of the following, one at a time: chocolate, lettuce, chicken, pork, onion, cabbage, fig, peanut, raisin.

After repeated tests of single foods have distinguished without any doubt the allergenic and nonallergenic lists, condiments, sauces and other commercial food mixtures may be tested according to the patient's taste.

Sugar-cane sensitivity, contrary to the opinion of leading allergists, is common and frequently associated with sensitivity to corn rather than with other cereal sensitivity. Most cane-sensitive persons are not allergic to beet and can therefore use beet-sugar. However, there are a few persons who are allergic to beet but not to cane. Evidently the cane-sensitivity is not directed towards the disaccharide since that is chemically identical in the two plants.

Sensitivity to alcoholic beverages involves a similar consideration. Some allergic persons can tolerate fermentation-products of grains (beer, whiskey) but not those derived from the grape; while the reactions of others are the reverse of this. This difference reflects the difference of the two groups of persons in their allergies to grain and grape, respectively. Again the alcohol is evidently not the allergen.

Some persons who are not allergic to either cereals or grape cannot tolerate any fermented beverage. Such individuals are regularly found allergic to the fermentative microorganisms and usually cannot tolerate cheeses.

In a number of instances after the single-food tests had been completed in the patient's home and a safe diet had been determined, the patient, although avoiding all his food-allergens, suffered recurrence of symptoms on returning to his place of business.

One of these is a jeweller (hypertension, marked irritability) whose blood pressure and disposition are normal on his vacation; another is a clerk (multiple sclerosis) whose pulse at home ranges from 60 to 70 while at his work desk it regularly rises to the mid-seventies (there are no food-allergens); a third is a wheat-sensitive baker (allergic dermatitis) whose pulse-dietary record for two days is presented in Table IV.

TABLE IV

Pulse-dietary record of a wheat-sensitive baker; at home and at the bakery

Day Off, at Home;			Work-day at Bakery;		
A.M.			A.M.		
9:00	61	milk	7:00	62	
9:30	63		7:30	68	banana, milk, orange, sugar
10:00	—	peas			
10:30	72				
11:00	—	lamb	at bakery after 8 min.		
11:30	61		20 min. later at		
12:00	—	beet	8:00	90	
P.M.					
12:30	57		8:30	86	
1:00	—	carrot	9:00	91	
1:30	59		12:00	88	beef, banana
			P.M.		
2:00	—	beef	12:30	98	
2:30	62				
3:00	—	orange	1:00	97	
3:30	59				
4:00	—	orange, sugar	1:30	91	
4:30	62				
5:00	—	corn			
5:30	60		6:00	at home (dinner) 60	
6:00	—	banana			
6:30	58		6:30	85	
7:00	—	date, honey	7:00	68	
7:30	68		7:30	68	
8:00	—	pork	9:00	64 retired	
8:30	64	retired			

Note. — = no pulse count

This record resembles that of the chef E. H. (hypertension), who also is allergic to wheat (1st Ed., p. 130). His normal maximal pulse-rate at home was 68, when working with wheat flour his pulse rose to 74 to 76. He never eats wheat products.

Drugs, Patent Medicines and Smoking

It has been found necessary to interdict, from the beginning of the examination, the use of drugs and patent medicines, because some of these have been found to cause tachycardia, which has interfered with the correct interpretation of the changes in the pulse-rate. It has seemed probable that in most of these instances the tachycardia was not a pharmacologic effect but a specific, allergic one. Morphine caused in E. F. C., instead of the desired quieting of the pulse-rate, an extraordinary tachycardia (180 beats per minute) which was followed by anginal pain.

It seems not impossible that in some persons a "food-allergic" sensitivity to cascara can actually act as a contributing cause of the constipation rather than as a means of its relief (in patient A. P. constipation and an unexplained tachycardia continued until she abandoned the use of a laxative containing cascara).

Antiallergic drugs also should be avoided by the subject excepting when the allergic symptom (headache, itching) becomes intolerable or interferes seriously with sleep. Dr. B. reported that gynergen taken at the peak of his migraine and tachycardia would soon relieve the headache *and lower the pulse-rate to his normal range*

Zinc ointment, prescribed for severely itching allergic dermatitis and applied on rising in the morning, regularly caused an immediate tachycardia, 96, before the patient had eaten. This acceleration of the pulse ceased as soon as the application of the ointment was omitted.

A certain popular lip-stick was the last identified cause of chronic rhinitis, abnormal tiredness and specific tachycardia in one patient

At first, also, the patient should not smoke. It has been found that at least 50 per cent of all allergic persons are sensitive to tobacco smoke (see Chapter XXIII). In such individuals unrestricted smoking would interfere with the interpretation of the pulse-dietary record. Moreover, in some persons tobacco is the chief, or actually the only, specific excitant of the allergic symptoms. It is not a rare experience that the mere cessation of smoking is followed immediately by a lowering of the pulse-rate and a disappearance of marked food-allergic symptoms—abnormal tiredness, headache, neuralgia, fearfulness, multiple sclerosis, dysmenorrhea, constipation.

As soon as the pulse-rate of the food-allergic patient has been brought to his normal range, the 15-minute smoking test may be carried out. This may be done in the evening one and one-half hours after dinner.

The test for tobacco-sensitivity is quite simply carried out as follows: Before beginning to smoke the patient counts the pulse twice at five to ten minute intervals making sure that the rate is within his *normal* range, after the first puff he makes five counts

at three minute intervals. If the rate at any of these counts rises above his *normal* maximum he (she) is to be considered allergic to tobacco. If the counts remain within the normal range there is no reason to think that smoking is harmful to that individual, and he may smoke thereafter.

NONALLERGIC INFLUENCES ON THE PULSE-RATE

The pulse-rate is subject to a number of nonspecific influences that seldom interfere with the diagnostic use of the specific tachycardia in idioblaptic allergy.

The high pulse-rate of the serious infections will hardly ever be mistaken for the effect of food-allergy upon the heart. It is also not likely that the presence of common cold will be overlooked in the examination of a food-allergic patient; and the diagnostic use of tachycardia should not be attempted as long as this infection continues. Patient J. G. was suffering a severe attack of common cold at his first visit, and his pulse-rate ranged from 82 to 110 in the two days of its duration. Thereafter, for 10 days previous to the beginning of the dietary treatment the pulse-rate ranged between 62 and 86.

Patient M.C.N., on a nonallergenic diet, suffered severe sunburn of the greater part of her body from a single day's exposure. Her pulse-rate at noon had risen to 88 (from 72 at breakfast) and by 6:00 P.M. it had reached 120 where it remained during the night. It did not fall below 96 in the next day. It is perhaps noteworthy that her outstanding "food-allergic" symptom—dizziness—did not appear in those two days, although there was some nausea.

Food-allergic persons are often inclined to ascribe their tachycardia to some physical exertion—walking upstairs, housework, gardening. It is true that physical exertion can cause an increased pulse-rate, the increase, in normal persons, depending on the violence of the exercise and the physical condition of the muscular system in the particular individual. However, the range of the pulse-rate of an ordinarily occupied nonallergic and otherwise normal person seldom, if ever, reaches the extent that is characteristic of food-allergy.

Nevertheless, the physician should advise the patient not to

engage in unusual muscular exercise just before observing the pulse-rate and may suggest that he count the pulse sitting.

Mental excitement or fear may rarely cause a disturbing acceleration of the pulse of even a nonallergic person—especially in the young.

These two last-mentioned nonspecific causes of acceleration of the pulse-rate produce an exaggerated effect on the food-allergic pulse. For example, one subject of food-allergy has several times observed an increase of only two beats per minute in his pulse-rate on walking up two flights of stairs when not under the influence of an allergenic food; whereas, when he is suffering an allergic headache the mere rising from his seat may cause an increase of 10 to 15 beats per minute.

Avoid Metal Cooking Utensils; Use Enamel or Glass

It has been pointed out that the symptoms of familial nonreaginic allergy are not infrequently caused by sensitivity to nonproteic excitants such as alkaloids (morphine, quinine) and synthetic drugs (aspirin, cinchophen, sulfanilamide). *Cutaneous sensitivity (dermatitis) to metals is a common occurrence, but one finds in the literature relatively very few reports of "food-allergic" symptoms due to sensitivity to metals.*

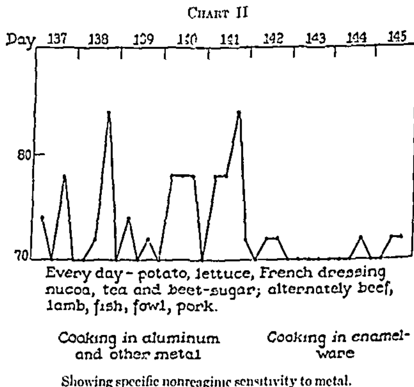
Vaughan in his *Practice of Allergy*, p. 831, mentions "the cure of cases of long-standing refractory colitis following change from aluminum cooking utensils to enamel or glass vessels," which was reported by Tchijevsky and Tchijevskaya in Moscow.

My own patient, A. F. C., was for a long time disturbed by unexplained tachycardia (up to 92 from normal maximum of 72) with headache and nervousness. When it became evident that these symptoms sometimes followed the eating of foods all of which had been proved beyond question to be at that time nonallergenic for this patient, attention was directed to the aluminum utensils that were being used for cooking. As soon as these were replaced with enamel ware, the unexplained symptoms became fewer and less marked, but did not altogether disappear until the stainless steel utensils came under definite suspicion and were replaced with Pyrex glass frying pans and enamel spoons.

Just at this time a similar difficulty was being encountered in

patient G. F. B. At the beginning of the study of this patient the maximal pulse-rates had ranged from 100 to 120. After elimination of the numerous allergenic foods that caused tachycardia, it was seen that the normal maximum would probably not be higher than 70, yet on a diet of proven nonallergenic foods there was a continually recurring unexplained tachycardia. The avoidance of aluminum-ware promptly reduced the maximal rate to 72. Chart II shows the general course of the pulse-rate in patient G. F. B. in the five days preceding the change and in the

CHART II



Showing specific nonreaginic sensitivity to metal.

four days following the avoidance of aluminum. Since the diet did not vary in these nine days there can be no doubt that the tachycardia had been caused by the use of aluminum utensils.

Metals have been found, in the six observed cases of the present series (A. F. C., G. F. B., M. A., K. S., R. C., K. M.), to be minor allergens, causing noticeable disturbance only after the major allergens and in one case (G. F. B.) even some of the other minor allergens have been eliminated from the diet.

The Most Favorable Age at which to Carry Out the Pulse-Dietary Survey

There are several important advantages in carrying out the pulse-dietary survey in the period between the ages of 5 and 10 years.

1. It is of some importance to free the child of the allergic handicap before it does too great damage to his school record.
2. It is of greater importance to those inclined to juvenile delinquency or lesser misbehavior to remove the physical causes of these allergic manifestations before the child has arrived at an age when those qualities usually show themselves openly
3. A number of the other symptomatic consequences of idioblaptic allergy tend to appear at later ages and can be prevented: epilepsy, hypertension, peptic ulcer, hemorrhoid.
4. When the large number of the food-allergens in a case necessitates the conservative sympathectomy (see Chapter X) the operation causes even less disturbance in the young than it does in adults. It has been successfully performed in eight children of ages three to 11, six of them in my vicinity. The healing in one of these was complicated by an infection of the wound. All of the others left the hospital on the fifth day excepting one, who on that day was transferred, for convenience, to the nursery play-room where he remained for a few days. None of these complained of postoperative pain, which is common in adults—especially in the inner aspect of the thigh on the side of the operation.
5. The recent report of Arthur P. Locke[2] indicates that children who are heavily handicapped with idioblaptic allergy and therefore in danger of the serious consequences of infantile paralysis may be made safe through relief from their allergy by avoidance of pulse-accelerating allergens. It is already known that this measure renders them resistant to common cold[3]. Ten-year-old children can be taught to count the pulse accurately and children of six years can

[2] Locke, A P · *Ann. Allergy*, 8 26, 1950
[3] Locke, A. P · *Ann New York Acad Sci*, 50.796, 1949.

understand the principle of allergic sensitivity and will learn through painful experience to avoid their allergens.

Elimination Diets and Other Diagnostic Tests for Idioblaptic Allergens

(Critical Discussion)

Before the idea of idioblaptic allergy as a familial, etiologic disease-entity was formulated—an entity exclusive of atopy and the skin-sensitizing reaginic mechanism—some idioblaptic manifestations were recognized by progressively minded physicians as allergic.

It is interesting to note the reluctance with which these men felt themselves being obliged to venture from the orthodox security of the cutaneous test. They were forced to their apostasy by the failure of that test in cases of obvious, sometimes violent, clinical *sensitivity to ingested foods. And the method of testing* which they used was dictated by common sense—the patients simply ate the food and noted whether it "agreed" with them or not.

This method of dietary testing was systematized by A. H. Rowe under the designation "elimination diet." Rowe writes, "When symptoms of probable food-allergy are not controlled by diets which exclude foods to which skin reactions have occurred, or if skin reactions to foods are negative, or impossible to perform, elimination diets may be used." To which Vaughan adds, "The elimination diet may be tried tentatively even prior to the performance of skin-tests." Further, he remarks, "Rowe does not insist that the elimination diet supplant the skin test . . ."

It is noteworthy that these pioneer protagonists of dietary testing express no doubt as to the allergic nature of the nonreaginic food-reactions they were eliciting; yet they do not suggest the possibility of a different specific mechanism mediating those reactions.

From a practical diagnostic viewpoint the elimination diet is highly inefficient. It suffers from two major drawbacks:

1. Prescribing a meal comprising 12 different categories of food, it hopes, by chance, to *exclude* the allergenic foods; this hope can be realized only if the offenders are few in number—an uncommon circumstance.

2. The criterion of positive reaction is symptomatic and therefore often subject to a time lag which covers up the connection with the test-ingestion.

The Escalator Procedure of A. F. R. Andresen

This more logical plan proposes positive testing of single foods in succession. It is used from the beginning of the testing or after a lucky elimination-dietary test has established a list of foods that is allergen-free.

Without the aid of the *immediate* pulse-reaction this plan also must depend upon a symptomatic reaction, which according to Vaughan may be delayed as long as 36 hours. Hence, Vaughan recommends that "one should wait at least two days between food additions." Such an interval is impractical if one is using the plan from the beginning of the testing.

Neither of these plans is applicable when the symptom is continual as in hypertension, overweight, eczema, conjunctivitis, hemorrhoid, etc.

The leucopenic index. This method of examination, which was so extensively studied by Vaughan, produces results with foods that are at variance with the cutaneous tests and often closer to the results of the clinical tests (by ingestion). The test must be done in a clinical laboratory or physician's office and requires, according to Vaughan, about two hours, after a half-morning's fasting period.

EOSINOPHILIA

There has been some criticism over my failure to examine my allergic cases for eosinophilia. The criticism is, of course, invalid.

Eosinophilia has been observed in *some* cases of asthma, nasal allergy, colitis, allergic appendicitis, *etc.*, either in the affected tissue or in the general blood circulation. Its absence does not prove that the condition is not allergic.

Idioblaptic allergy affects about 90 per cent of the white population. Do the critics suggest that all, or even many, of these 90 per cent should present an eosinophilia of the circulating blood? More particularly are they suggesting that it is important to the

definition of idioblapsis as an allergic disease to demonstrate eosinophilia in migraine, constipation, hypertension, and emotional irritability?

References

Rowe, A. H.: *Elimination Diets, etc.* Philadelphia, Lea & Febiger, 1941.
Andresen, A. F. R.: *Ann. J. Digest. Dis. & Nutrition,* *1*:14, 1934.
Vaughan, W. T.: *Practice of Allergy.* St. Louis, Mosby, p. 228.

CHAPTER III

Difficulties of Interpretation of the Pulse-Diet Record

IN EARLIER COMMUNICATIONS it has been stated that the clinical manifestations of idioblaptic allergy are so constantly accompanied by tachycardia that the offending allergens can usually be identified through the use of that objective criterion. In other words, if a food or an inhaled material (dust, smoke, perfume) causes an acceleration of the heart-beat—usually within 90 minutes but sometimes within five minutes—this effect marks the ingested food or inhaled material as the possible excitant of the food-allergic symptom-complex complained of by the individual.

Unfortunately, the practical diagnostic use of this simple idea is often heavily complicated by a number of difficulties, six of which will now be discussed in some detail. These are:

1. The "latent period" of temporarily lost sensitivity.
2. The carry-over or recurrent reaction.
3. The principle of major and minor allergens.
4. The depression of the reactivity of the shock-tissue by single or rapidly repeated allergic reactions.
5. Sensitivity to a large number of important foods.
6. Sensitivity to practically unavoidable inhalants, known or unknown.

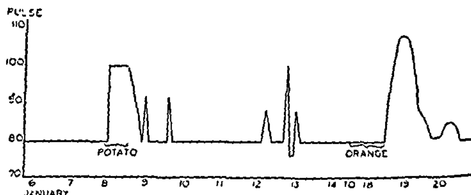
1. The Latent Period

The first instance of this phenomenon that I encountered was in the case of M. M. D. in the test with an orange (see Chart III). The patient had not eaten an orange for some time, weeks, when she began the test on January 16th. She ate an orange also at the three meals on the 17th and in the morning of the 18th, with

no allergic symptom till noon on the 18th when headache and tachycardia (to 104) appeared together.

In the case of A. F. C. it had been noticed that after sensitivity to a number of vegetable foods had been unquestionably established in several separate tests, in all of which the allergenic food had been eaten in generous quantity several times over a period of one or more days, if the food was avoided for a long time it could always be eaten once, often more than once, with impunity. I began to generalize my thoughts about this recurring phenomenon after I came across the following statement by Vaughan: "This, we shall see, is very characteristic of food allergy, that an allergenic food may be eaten at times with impunity, at other times with consequent symptoms."

CHART III



The course of pulse-rate in patient M. M. D. on the sixth to the twentieth day of observation.

The thought took a practical turn upon the following observation of J. G. (see Chart IV), who had been found sensitive to wheat. About two months after his first test with wheat, he ate, only at one meal, an unstinted quantity of bread after which he suffered no clinical symptoms and observed no rise of the pulse-rate above his normal maximum.

The relatively short interval (two months) between the two tests with wheat suggested the question how short the interval can be made without the occurrence of a reaction. This question was studied in the case of A. F. C., by administering at six- or seven-day intervals a number of vegetables and fruits to all of which he had been proved sensitive. Some of these foods (peas, string beans, lima beans, beet, date, raisin) had not been eaten for several weeks, some not for several years (asparagus, broccoli, alligator pear, celery, apple, yam, squash, endive, tomato, onion, peach, pear, prune, blueberry, raspberry, and cane sugar). With

three exceptions no tachycardia or allergic symptom followed the first two ingestions of these foods

Broccoli caused no symptoms on the first ingestion, but after the second, six days later, there was heartburn and an eight-point rise of the pulse-rate from the normal maximum of 72. Squash on the first eating caused no reaction, but one week later it caused nervousness and a tachycardia (93). Yam, eaten for the first time after an abstinence of many years, caused headache and heartburn, the latter being felt within a few hours, and the former on the following morning

Patient A. R (see Charts V and VI), after abstaining from milk for six months, has taken a glass of milk once without experiencing symptoms or tachycardia.

There was a similar experience with oranges in the case of C. T., symptoms being delayed for nearly forty-eight hours.

In some instances in the case of A F. C. opportunity has been had *to observe* that the longer the interval of abstinence from an allergenic food the longer the latent period. Thus, string beans, after having been previously avoided for a number of years, were eaten almost every day from October 3, 1939, until March 10, 1940, when symptoms and tachycardia appeared, which ceased about twenty-four hours after the last consumption of string beans. On April 13 eating of string beans was resumed, at first at four- to five-day intervals and from May 22 at seven-day intervals without symptoms until June 19, when mild headache appeared in the night, and again June 26, when abdominal pain followed soon after eating the beans After an interval of two weeks, indulgence in a liberal quantity of the beans was followed shortly by slight intestinal discomfort The pulse-rate was 72 after walking up two flights of stairs.

Grapes and raisins had previously been avoided for about nine years, when after January 10, 1940, they were taken almost daily without symptoms, until February 12, on which date heartburn, flatus, and headache appeared. Lettuce, which was also being eaten, was discontinued on February 16; but the headaches, heartburn, and flatus continued until twenty-four hours after grapes and raisins were omitted on February 28. There were no allergic symptoms after February 29 until March 4 (heartburn from rice wafers) and March 10 when headache marked the return of sensitivity to string bean.

From the foregoing data it is seen that *the latent* period of idioblaptic allergy is not constant. It varies in different persons and in the same individual with respect to different foods. The latent period has been encountered in 13 of 31 patients (E. F. C., M. M. D., C. T, J. G., W. W. F., R. M., H. A. S., J. F., W. S. C., A R., R. F., M. D. B, L. H. B.). Most of the 13 patients are making regular practical use of the phenomenon by eating the respective allergenic foods at safe intervals.

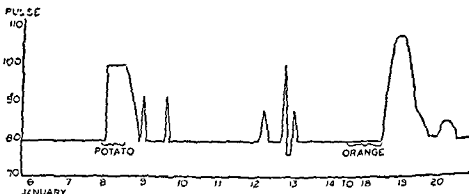
The phenomenon of the latent period is clearly described by Vaughan,[1] who cites in illustration a case of sensitivity to egg with avoidance of that food "for three years." The patient, being

[1] Vaughan, W T: *Practice of Allergy.* St Louis, Mosby, p. 311, 1939.

no allergic symptom till noon on the 18th when headache and tachycardia (to 104) appeared together.

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CHART III



The course of pulse-rate in patient M. M. D. on the sixth to the twentieth day of observation

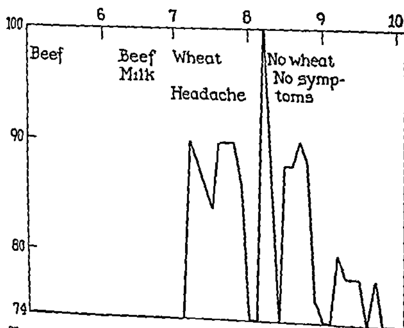
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hours—passes off and, on the following day, recurs in greater or less or equal intensity.

The phenomenon undoubtedly occurs in some food-allergic persons under ordinary circumstances, but it could be identified as such only under experimental conditions in which it could be determined that the recurrent reaction was not caused by exposure to a second allergen.

CHART IV



The course of the pulse-rate in patient J. G. on the first five days of the trial diet

The carry-over is illustrated in the record of M. M. D. (Chart III). The patient stopped eating potato on January 8th after lunch. The two spikes of tachycardia on the 9th are recurrent reactions to the same allergen. The reaction to orange on the 18th continued without remission into the 19th and recurred in the afternoon of the 20th, at which time headache also recurred.

Other examples of the "carry-over" are seen in the pulse-record of J. G. (Chart IV), in the record of A. R. (Charts V and VI), and in that of C. T. (Charts VII, VIII, and IX).

found "negative" to the cutaneous test, resumed the eating of egg and, one month later, began again to exhibit the allergic symptom (migraine). In such a case Vaughan speaks of the allergenic food as a "build-up" food, referring to the time required, after the period of avoidance, for the re-establishment ("build-up") of the sensitivity.

Significance of the Latent Period of Idioblaptic Allergy

An interpretation of the latent period of food-allergy is found in a simple description of the fact in other words: namely, the sensitivity is lost for a time, the duration of which depends, probably among other things, upon the length of the period of avoidance.

One may say that in many instances continual contact with the excitants of nonreaginic food-allergy is necessary for the maintenance of that kind of human allergic disease. Vaughan evidently entertains the same view of the phenomenon.

This phenomenon is seldom, if ever, observed in reaginic atopy. It is true that reaginic atopy is sometimes "outgrown" but not necessarily following avoidance. Indeed, it seems well established that the natural process of outgrowing hay-fever is often expedited by artificially increasing the exposure to the excitants of it. Under the specific therapy of hay-fever by injections of an extract of pollen, the reagin-content of the blood diminishes in many patients after a few years of continual (perennial) treatment.[1]

Thus the "latent period" of idioblaptic allergy stands as a mark of differentiation of this category from the atopic group.

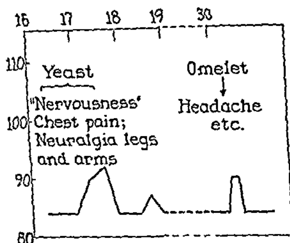
It is evident that the negative result of a test made in the latent period of a *particular food can be misleading and that the examiner* must avoid such error by retesting each new food within three or four days if the first test results negatively. In rare instances effective sensitivity may be lost after only two days' abstinence from an allergenic food.

2. The Carry-Over or Recurrent Reaction

The carry-over is seen when an allergic reaction due to the eating of a single food reaches its peak in a short time—say a couple of

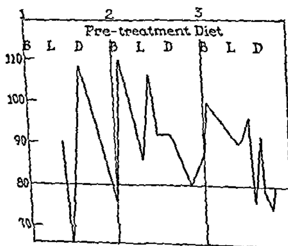
[1] Markow, E. and Spain, W. C.: *J. Allergy*, 4:363, 1933; *Ibid*, 6:227, 1935.

CHART VI



The course of the pulse-rate in patient A. R. on the sixteenth to the thirtieth day of observation.

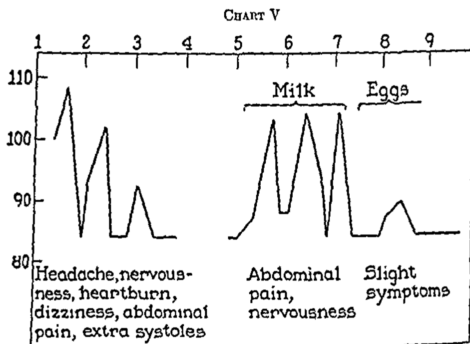
CHART VII



The course of the pulse-rate in patient C T. on three days prior to the period of trial diet. *B*, breakfast; *L*, lunch, *D*, dinner.

While it is not possible, with our present methods, to obtain experimental explanation of the remissions of the allergic reactions that characterize the recurrent reactions, as distinguished from a prolonged unremitting reaction, it seems reasonable to suspect that the remissions and recurrences reflect the interplay of depressions of the shock-tissues and varying absorption of the residue of undigested allergen in the different portions of the alimentary canal, which may be influenced by variations of

Chart V



The course of the pulse-rate in patient A. R. on three days previous to the period of trial diet, and on the first five days of the trial diet.

peristalsis that in turn may be influenced by eating or drinking, physical activity and other factors. We shall return to this matter presently (p. 49).

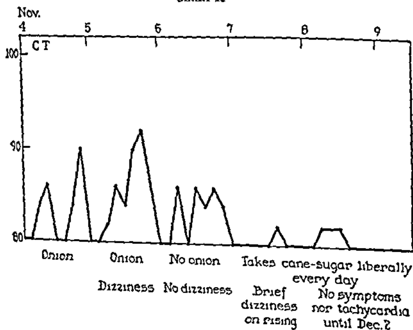
At any rate, the recurrent reactions, which may continue for days after the ingestion of a single allergen, are a characteristic food-allergic phenomenon that may be recognized as such, whatever the particular allergic symptom—epilepsy, migraine, urticaria, hypertension.

3. The Principle of Major and Minor Allergens

In the course of this study the following phenomenon has been repeatedly observed:

A subject of nonreaginic food-allergy who has been entirely relieved of the allergic symptoms through avoidance of certain foods may suddenly suffer a relapse of the symptoms. Dietary analysis now shows the symptoms to be due to one or more additional foods that have been eaten frequently, in some cases

Chart X



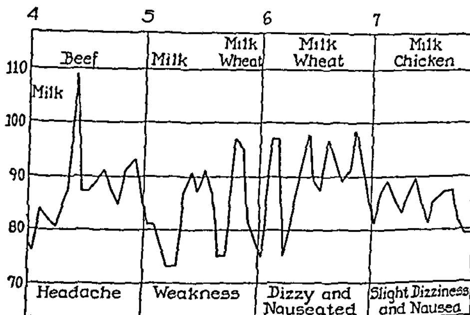
Showing sensitivity to onion (Nov. 4–Nov. 6) and absence of clinical sensitivity to sugar-cane (Nov. 7–Nov. 9) in patient C. T.

daily and in liberal quantities, throughout the life of the patient up to the time of the relapse

While these occurrences have the appearance of newly acquired sensitivities, several facts concerning them speak for another explanation; these are:

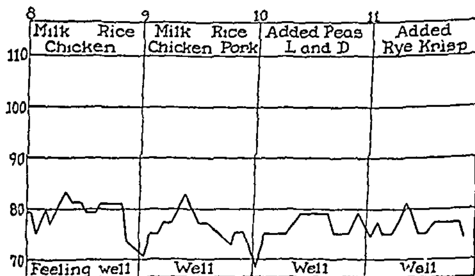
(1) In some instances the patient has been aware, through earlier experience, of the existence of his sensitivity to the newly recognized allergen. This is illustrated in the following experiences:

CHART VIII



The course of the pulse-rate in patient C. T. on the first four days of the trial diet.

CHART IX



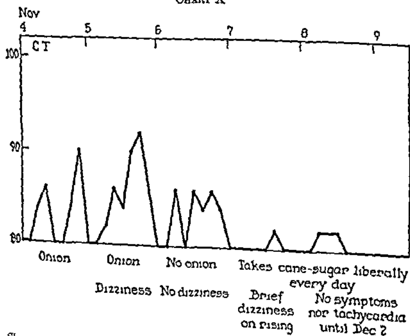
The course of the pulse-rate in patient C. T. on the second four-day period of the trial diet.

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In the course of this study the following phenomenon has been repeatedly observed:

A subject of nonreaginic food-allergy who has been entirely relieved of the allergic symptoms through avoidance of certain foods may suddenly suffer a relapse of the symptoms. Dietary analysis now shows the symptoms to be due to one or more additional foods that have been eaten frequently, in some cases

CHART X



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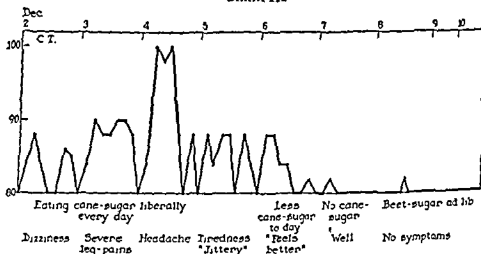
While these occurrences have the appearance of newly acquired sensitivities, several facts concerning them speak for another explanation; these are:

(1) In some instances the patient has been aware, through earlier experience, of the existence of his sensitivity to the newly recognized allergen. This is illustrated in the following experiences:

Patient A. F. C. had eaten lettuce liberally at short intervals as long as he could remember, and had been eating it at least once daily without noticeable disturbance in the preceding months, when suddenly on May 28, 1939, he experienced marked heartburn after lunch and again after dinner. All of the items of these two menus, excepting lettuce and potato, were entirely nonallergenic for this person. Lettuce was then avoided and the patient was symptom-free until June 1, when lettuce was eaten at dinner without potato; heartburn was again experienced. On June 4 and June 10, the eating of lettuce was followed by heartburn. Lettuce was then eliminated entirely from the diet and there were no further symptoms in the next month.

There is some reason to think that there was a submerged minor sensitivity to lettuce in patient A. F. C. In the summer of 1923, seven years before he began to use the method of "elimination diet" (without benefit of the criterion of the allergic tachycardia), A. F. C., having greatly restricted his diet on account

CHART XI



Showing the emergence of sensitivity to sugar-cane in patient C. T. December 2; no sensitivity to beet sugar December 8–10.

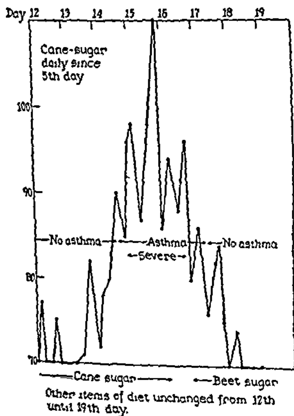
of unusual gastro-intestinal and other food-allergic symptoms, suffered severe heartburn after every ingestion of lettuce but not after any meal that did not include lettuce. He thought that the symptoms were due to some peculiarity of the particular variety of lettuce (a local product).

(2) The newly detected allergen is sometimes botanically related to one that has been incriminated earlier. This has been illustrated several times in the cereal family (wheat, rye, rice, oat, corn, sugar-cane), and in these cases the first member to show itself has usually been wheat. This has been seen in patients A. F. C. and C. T.

J. G. and M. B., both sensitive to wheat, have not yet shown sensitivity to rice, rye and corn after more than 14 months' restriction of intake of wheat. Both of these patients are only moderately sensitive to wheat, exhibiting no symptoms when they eat bread at sufficient intervals. J. G. is equally sensitive to sugar-cane, M. B not at all.

C. T. (see Charts VIII and IX) showed her sensitivity to wheat and cereals long before that to sugar-cane. She had avoided wheat but had been eating other cereals and cane-sugar daily in liberal quantities since the conclusion of her trial-dietary course March 1, 1940, and had been free of unexplained food-allergic symptoms until she began, in October, to eat onions frequently. Avoidance of all cereals, but not cane-sugar, and of onions (from November 6—Chart X) was

CHART XII



Showing the emergence of a minor sensitivity to sugar-cane on the 13th day of trial diet.

soon followed by cessation of the tachycardia (80 to 92) and the dizziness, nervousness and headache that had recurred, and the patient was again symptom-free (pulse-rate not over 80) until December 2. On that date tachycardia (88) and severe dizziness suddenly recurred On December 3 there were severe "pains in the legs" and a maximal pulse-rate of 90 On December 4, the pulse-rate rose to 100 and there was headache The intake of cane-sugar was greatly

lessened on December 5 and the patient "felt better," the maximal pulse-rate falling to 82. On the 6th and thereafter no cane-sugar was eaten, the symptoms ceased entirely and the normal maximal pulse-rate of 78 was re-established (see Chart XI).

The patient was symptom-free after that date, until May, 1941, when sensitivity to potato appeared (pulse-rate up to 100). After elimination of potato, there was freedom from symptoms until the first of June, when sensitivities appeared at about the same time to peach, banana, strawberry and aluminum.

M. A., a cereal-sensitive subject of nonreaginic bronchial asthma, exhibited sensitivity to sugar-cane suddenly on the thirteenth day of the dietary test, having eaten the sugar daily without reaction (see Chart XII).

As is well known to allergists, tomato and potato are species of the nightshade family, and this close botanical relationship is reflected in the fact that most food-allergic patients who are affected by one of these foods exhibit a sensitivity also to the other. In the present series, 16 patients are sensitive to one or both of these foods. Ten are sensitive to both, four are sensitive only to potato, and two only to tomato. Among those that are sensitive to both, some (A. F. C., C. T., J. F.) are more sensitive to tomato, while others (E. F. C., K. S.) are more sensitive to potato. All of the six patients who were sensitive to only one species showed only a mild sensitivity to that one. As with the cereal group, the sensitivities to these two foods often do not "emerge" simultaneously in the affected patient.

Patient C. T. recognized her sensitivity to tomato in February, 1940. Her sensitivity to potato became apparent May 8, 1941, after the incrimination of onion and sugar-cane, and before the detection of banana, strawberry, aluminum and peach.

A. F. C. had recognized his sensitivity to tomato in 1935–36, but had continued eating them at one-week intervals, with only occasional slight reaction (heartburn), until October 23, 1940, when the marked reaction (pulse-rate 86) required a lengthening of the intervals. Potato was eaten after this time, at the usual weekly intervals, without any symptom up to and including February 14, 1941; then no more until July 17. Milk (cow's), chicken and banana had been eaten daily without causing any noticeable symptom until July 1, 1941. On this date a breakfast of milk and banana was followed within 10 to 15 minutes by a marked gastric uneasiness and a pulse-rate of 90. Two hours later the pulse-rate was still high (82) and there was a feeling of

unsteadiness. Thereafter, a diet of beef and banana caused no symptoms (pulse-rate 60 to 72 excepting once 78) until July 3. On this date the evening meal of chicken and banana was followed immediately by nervousness (pulse-rate 80). There were cramps and much gas in the night and, on rising, some dizziness and ringing in the ears. The diet on July 4 and 5 consisted *only* of beef and bananas. All symptoms had subsided and the pulse-rate ranged between 56 and 66. On July 6 the rising pulse was 60; breakfast consisted only of bananas. Within 25 minutes there was acute gastric pain growing more severe for 10 minutes then suddenly disappearing (a common allergic experience in this patient). The pulse-rate was 76 as the pain disappeared, rising to 86 in the next hour. There were recurrences of symptoms (extreme nervousness and anorexia (pulse-rate 90 or more)) into the next day, and on this day injections of histamine were begun.

It seems evident from the foregoing experiences, first, that the allergic reaction differs in degree in the same person to different allergens, and, secondly, that in some instances, so long as the more strongly allergenic foods (*major allergens*) are being eaten and for varying periods after they have been eliminated from the diet, the less active ones (*minor allergens*) may cause no allergic disturbance.

This conclusion carried with it the practically important corollary that there exists in at least some food-allergic persons a certain degree of tolerance to the allergic injury and that this tolerance must be nonspecific. Furthermore, from this point it is a short step to the histamine-theory, since the nonspecific histamine-like H-substance has already been recognized as the ultimate injurious agent in allergy and also because the existence of a nonspecific tolerance for histamine has already been demonstrated.

One may express the foregoing theoretical concept in the following more concrete language: The larger quantities of H-substance, that may be assumed to be released in the reactions to the major allergens, can produce a tolerance sufficient to withstand the lesser quantities that are released in the milder reactions to the minor allergens.

It seemed possible to test the correctness of this explanation and

at the same time, perhaps, to adduce evidence regarding the histamine-theory in general, through the therapeutic experiment with a pure histamine salt—histamine diphosphate.

I am assuming that the last foods (milk, chicken, banana) that had to be abandoned by A. F. C. were the weakest in that individual and, furthermore, that at the time when they were eliminated the tolerance toward the H-substance in the allergic tissues of A. F. C. was very low, if not entirely absent. If this is true and if the "H-substance" is actually histamine, it was to be expected that a sufficient tolerance could be quickly restored through subcutaneous injections of histamine into A. F. C. to permit *restoration of milk, chicken and banana to his diet.* This anticipation was realized.

The first injection on July 7 was of 0.25 ml of a solution containing 0.0275 mg/ml of histamine diphosphate (0.01 mg of histamine base). On July 8, 9 and 10 the doses were 0.3, 0.35 and 0.4 ml. On July 10 milk, chicken and banana were eaten in liberal quantities with not the slightest discomfort (pulse-rate 62 to 78) and remained in the diet until his sympathectomy 10 months later.

In view of the limited success of histamine-therapy in allergic disease that has been reported by other observers, it was also to be expected that the tolerance toward histamine that is attained by its injection would not protect the individual against the larger releases resulting from the major allergic reactions. This *expectation has been realized in the case of A. F. C. and that of* C. T.

On July 17 potato (a relatively minor allergen in A. F. C., see p. 32) was added to his diet and was eaten almost daily with no reaction until July 31, when a meal of beef, potato, banana and milk was followed by headache (pulse-rate 84). This indicated that the sensitivity to potato was re-established (end of latent period) and had passed beyond the capacity of the histamine tolerance, at the time, to withstand it. The dose of histamine on the previous day had been 0.5 ml of a solution containing 0.1 mg/ml. On August 9 the daily eating of potato was resumed without reaction, the dose of the histamine solution having reached 0.95 ml. In the interval between July 31 and August 9

reactions were caused by oat and corn and by spinach (major allergens).

A similar therapeutic experiment was carried out in patient C. T. with similar results.

Following is the list of the foods in the case of C. T. in approximately the order of their allergenic activity:

Group 1 (Major)	Group 2 (Medium)	Group 3 (Minor)
Beef	Tomato (canker-sores "rash")	Sugar-cane
Wheat	Rice	Potato
Orange	Rye	Banana
Grapefruit	Corn	Strawberry
Lemon	Oat	Aluminum
Plum (prune)	Coffee	
	Onion	

On July 20, 1941, an intracutaneous injection of 0.025 ml of a solution of histamine containing 0.01 mg/ml produced a wheal measuring 6 mm in diameter with a flare 2.5 cm in width. A subcutaneous injection of 0.1 ml of that solution was given and thereafter daily injections of increasing quantities were made until mid-September, when a dose of 1.0 ml of the 10-times stronger solution was reached. In this period there was a weekly gain of weight of two pounds or more.

Since arriving at that maximal dose of histamine, the patient was able to restore all of the foods listed under "group 3" and also tomato to her diet without suffering allergic symptoms or exhibiting allergic tachycardia. She could eat with impunity foods cooked in aluminum. On the other hand, single tests with wheat and corn still caused both tachycardia and allergic symptoms.

I have defined the expressions major and minor allergens as relative terms, not absolute ones. Thus, a minor food-allergen is one that causes a relatively mild allergic reaction or none at all if eaten at a time when a *major* allergen also is being eaten. I have seen a number of instances in which a minor allergen, as just defined, could be eaten *once, at intervals* of, say, one or two weeks or longer, without causing any allergic reaction (latent period), and Price suggests that this be taken as the sole criterion

at the same time, perhaps, to adduce evidence regarding the histamine-theory in general, through the therapeutic experiment with a pure histamine salt—histamine diphosphate.

I am assuming that the last foods (milk, chicken, banana) that had to be abandoned by A. F. C. were the weakest in that individual and, furthermore, that at the time when they were eliminated the tolerance toward the H-substance in the allergic tissues of A. F. C. was very low, if not entirely absent. If this is true and if the "H-substance" is actually histamine, it was to be expected that a sufficient tolerance could be quickly restored through subcutaneous injections of histamine into A. F. C. to permit restoration of milk, chicken and banana to his diet. This anticipation was realized.

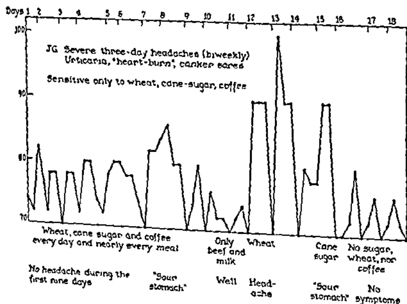
The first injection on July 7 was of 0.25 ml of a solution containing 0.0275 mg/ml of histamine diphosphate (0.01 mg of histamine base). On July 8, 9 and 10 the doses were 0.3, 0.35 and 0.4 ml. On July 10 milk, chicken and banana were eaten in liberal quantities with not the slightest discomfort (pulse-rate 62 to 78) and remained in the diet until his sympathectomy 10 months later.

In view of the limited success of histamine-therapy in allergic disease that has been reported by other observers, it was also to be expected that the tolerance toward histamine that is attained by its injection would not protect the individual against the larger releases resulting from the major allergic reactions. This expectation has been realized in the case of A. F. C. and that of C. T.

On July 17 potato (a relatively minor allergen in A. F. C., see p. 32) was added to his diet and was eaten almost daily with no reaction until July 31, when a meal of beef, potato, banana and milk was followed by headache (pulse-rate 84). This indicated that the sensitivity to potato was re-established (end of latent period) and had passed beyond the capacity of the histamine tolerance, at the time, to withstand it. The dose of histamine on the previous day had been 0.5 ml of a solution containing 0.1 mg/ml. On August 9 the daily eating of potato was resumed without reaction, the dose of the histamine solution having reached 0.95 ml. In the interval between July 31 and August 9

powerful, major allergens, are incapable of reacting maximally to those allergens in the quantities to which they are being exposed, or to less powerful allergens in usual quantities. However, the histamine-theory now provides a more satisfying explanation of these occurrences. The avoidance, accidental or deliberate, of the major allergens may quickly permit a loss of tolerance for histamine which exposes the tissues to the action of even usual quantities of those allergens.

CHART XIII



In that state of restored reactivity the shock-tissues may also be affected by some minor allergens.

The curve of the pulse-rate of patient J. G. may be interpreted in this sense (Chart XIII).

J. G. was found to be nonreaginically sensitive to wheat, coffee and cane-sugar, all of which foods were eaten daily, and usually at all three meals, during the ten-day period of preliminary observation. There had been headache, edema of the face and canker sores and a maximum of 86 in the pulse-rate on the day previous to the first day of the charted record. In the next five days there were no symptoms and the highest pulse-rate was 80,

of a minor allergen. This idea also leaves the term with a relative sense.

Price points out that the sensitivities of some persons are all weak; that is, all of their allergens (usually few) can be eaten at intervals with impunity.

4. The Depression of Allergic Reactivity

The question arose why attacks of food-allergic symptoms are usually spaced and often separated by considerable intervals of time. Such a question can hardly be approached experimentally, hence one must resort to conjecture supported somewhat by accidental observation. My own experiences have suggested two possible factors in explanation of the discontinuity of the food-allergic attacks. The *first of these is quantitative*. *For example:* Patient A. F. C. from the age of 25 suffered severe attacks of *migraine which recurred at intervals of one to two weeks.* Between the attacks there was a nearly continual sense of intracranial "tightness" without pain. In this period of his life, sensitivity to lemon, cornstarch, and gelatin, derived from pig-skins, was recognized by the regularity with which gastric pain occurred immediately after the ingestion of liberal quantities of these foods. It was also noticed that attacks always followed a picnic-lunch, which consisted largely of ham-sandwiches, lemonade and cake (all containing food-elements—wheat, cane-sugar, *pork* and lemon—to which A. F. C. *has been found highly sensitive*).

These experiences suggest a quantitative factor in the causation of the attacks.

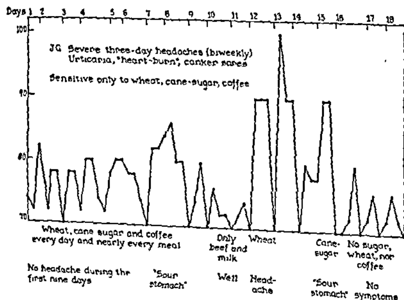
There *is a second consideration, which may be equally effective.*

After A. F. C. *had eliminated from his diet the major excitants* of his attacks (cereals, lemon, pork), he began to experience mild headache, and/or heartburn soon after the ingestion of a number of foods, minor allergens, that previously had caused no noticeable disturbance. As these were eliminated still others showed themselves as excitants of the food-allergic symptoms.

It seems as though the shock-tissues of nonreaginic food-allergy, when they are under the constant influence of more

powerful, major allergens, are incapable of reacting maximally to those allergens in the quantities to which they are being exposed, or to less powerful allergens in usual quantities. However, the histamine-theory now provides a more satisfying explanation of these occurrences. The avoidance, accidental or deliberate, of the major allergens may quickly permit a loss of tolerance for histamine which exposes the tissues to the action of even usual quantities of those allergens.

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On the eighth day there was a transient heartburn and a coincidental pulse-rate of 86. On the ninth day there were no symptoms; the maximal pulse-rate was 80.

On the tenth and eleventh days—the first two days of the trial diet (large quantities of milk and beef-steak)—there were no symptoms and the maximal pulse-rate was respectively 76 and 74. On the twelfth day wheat was taken at all three meals. There was headache and the pulse reached 90 for a short time after *breakfast, and during a period of one hour after the evening* meal. On the thirteenth day no wheat was eaten, but a pulse-rate of 100 was reached on one *occasion* and 90 was recorded at four other times during the day (recurrent reaction).

On the fourteenth day (steak, peas, milk) there were no symptoms and the pulse ranged from its early morning maximum of 80 down to 70, one and one-half hours after the evening meal.

On the fifteenth day, at lunch, cane-sugar was taken and the pulse-rate rose suddenly from 72 (taken just before eating) to 90 within one hour after eating.

There were no symptoms in the next three days (on beef, peas, milk, potato) and the maximal pulse-rates were respectively 80, 76 and 76.

It is seen in the foregoing that under continual allergic insult the pulse-rate did not exceed 86 in a period of ten days and did not pass 80 in five days of the period; the symptomatology during the ten days was consistent with the pulse-rate. However, after only two days of abstinence from the allergenic foods there was an *immediate vigorous cardiac reaction to wheat (pulse-rate* 90 to 100) with headache. This unusual reactivity recurred (to cane-sugar) after another short interval of rest of the shock tissues.

To summarize the foregoing concretely, one may assume that a subject of discontinuous migraine has just recovered from an attack of that condition and continues to eat the allergenic foods *daily in moderate quantities, not being entirely free from* allergic symptoms. The next attack may be precipitated either by ingestion of unusually large quantities of one or more major allergenic foods or by a brief avoidance of all of the major allergens followed by indulgence in them in even moderate quantity.

The explanation that has just been proposed on the basis of continued observation of two cases is by no means always applicable. It is a common experience of food-allergic persons that the allergic symptoms may be entirely absent during a pleasant vacation or sea-voyage, although the diet may remain practically unchanged. This apparently psychic influence of change of environment upon food-allergic symptoms has its opposite counterpart in the psychogenic precipitation of an attack of food-allergic symptoms. A number of instances of this phenomenon are described by Vaughan in Chapter XVI of his *Practice of Allergy*.

One of my patients (M. M. D.), previous to the avoidance of her nonreaginic food-allergens, frequently suffered asthmatic attacks that were precipitated by mental excitement or by sudden exposure to a cold wind. Since she eliminated those foods from her diet she is not affected in the least degree by either of these two precipitating causes. This case suggests the question as to the relation of idioblaptic allergy to the so-called physical allergies, as well as to the significance of the psychic factors in food-allergy.

It would seem necessary to assume the existence of still other, possibly local, factors to explain in some patients the lessening of the severity of some symptoms (headache, for example) at a time when other symptoms (for example, dizziness) are beginning to appear.

5. Sensitivity to a Large Number of Important Foods

Many food-allergic patients have been encountered in this study who were demonstrably sensitive to so many important foods that life could not be maintained with the small residue of their non-allergenic foods. In such cases even daily injections of histamine were found to be of too limited effectiveness to justify the trouble and expense of them (see discussion of Major and Minor Allergens and Histamine-Therapy).

Fortunately, an escape from this dilemma for many such persons has been found in a conservative lumbar sympathectomy, the effect of which in food-allergy is discussed in Chapter X.

6. Sensitivity to Inhalants, Known or Unknown, which Are Difficult to Avoid

This obstacle has been encountered in only a few instances. In one of these (a woman suffering from arthritis, whose occupation required her to associate closely with other women), exposure to perfumes caused exacerbation of her arthritic pain, accompanied by marked tachycardia. In a second case (an epileptic child of 11 years), there was a marked sensitivity to tobacco smoke and to some other unidentified inhalant. These sensitivities were not extinguished by sympathectomy, but they are being controlled with daily moderate doses of dilantin. In a third case of chronic colitis in an adult female, there is nonreaginic sensitivity to an unidentified inhalant allergen to which she is exposed when riding in a passenger-bus. Within a half hour after boarding a bus she always suffers a colonic cramp that presages diarrhea.

Nonreaginic sensitivity to "house-dust" and tobacco occurs not infrequently and is sometimes not easy to detect. The case is plain if the pulse-rate on rising is regularly higher than the rate on retiring, such an occurrence indicating sensitivity to "house-dust."

Sensitivity to tobacco is naturally looked for in smokers; but it seems advisable to test non-smokers also with tobacco, since it has been found important for some persons to try to avoid the smoke of others.

Among the more troublesome inhalant allergens are automobile-exhaust fumes, smoke from burning wood, illuminating gas and vapors from paint.

The unidentified inhalant allergen is troublesome, not alone because it cannot easily be avoided, but also because it can seriously interfere with the identification of the allergenic and the non-allergenic foods in the usual tests with the method of pulse-controlled trial-diet.

CHAPTER IV

The Art of Interpreting the Pulse-Diet Record

IT WAS PROPER, in the first reports concerning the dietary treatment of the manifestations of familial nonreaginic allergy, to give prominence to the typical, uncomplicated cases illustrating the phenomenon of specific tachycardia; although it was pointed out that difficulties of interpretation of the pulse-diet record frequently arise, which are caused by several apparent exceptions to the regularly observed pulse-accelerating effect of the allergens in this category of allergic disease.

The apparent exceptions referred to have been previously discussed; they are the "recurrent" reaction, the "latent period" of temporarily lost sensitivity after more or less prolonged avoidance of the allergen, the delayed reaction, the emergence of sensitivity to minor allergens, and the depression of the reactivity of the shock tissues by allergic insults.

The recurrent reaction ("carry-over") is illustrated in the charts of the pulse records of M. M. D., A. R., J. G., and C. T. (see Chapter III). Evidently the pulse-accelerating effect of an allergenic food may be partly or entirely obscured if contact with the food is had at the time of a carry-over from another allergen. Also, a series of strong allergic reactions, sometimes even a single one, may so depress the shock tissue that a further exposure to the same or another allergen may fail to elicit more than a slight reaction. Finally, a carry-over effect may be mistaken for a reaction to a new food to which the patient is not allergic.

These difficulties are especially disturbing if they present themselves at the outset of the treatment as some of them, with others, did in W. R., a part of whose pulse-diet record is shown in Table V.

On the two days just preceding the first day (December 8) of the trial diet the patient had eaten repeatedly two of his major allergens (egg, bean). Although he had eaten nothing since lunch on December 7, there was a marked acceleration of the pulse (carry-over) *after his breakfast of oatmeal, to which he is not al-*

TABLE V

Date December	8	9	10	11	12	16	18
	Pulse						
B. R.—	60	61	56	56	59	56	64
Br.	63	55	57	67	65	62	65
30′	77	75	72	79	66	68	66
60′	90	83	81	75	63	66	65
90′	85	88	88	68	69	65	62
Diet	oatmeal	orange EGGS	EGGS milk	EGGS milk	banana milk	cream of wheat ham, toast milk	prunes sugar cornflakes milk
Mid. A. M.	*	77	79	62	.	67	63
30′	74	83	81	64		69	67
60′	79	79	87	65	.	71	63
90′	75	72	76	62		70	68
Diet	milk	carrot	tomato	tomato		grapes	tangerines
Lunch	*	65	85	55	60	63	64
30′	68	76	90	63	63	71	66
60′	70	86	88	62	57	67	64
90′	73	84	88	59	63	64	63
Diet	EGGS	beet	fish STRING BEANS cole-slaw milk	salmon milk	carrot banana junket	lambchops milk	lambchops milk
Mid. P. M.	*	.	88	62	.	68	.
30′	86	.	80	59	.	70	.
60′	88	.	77	67		71	.
90′	76	.	78	59		69	.
Diet	apple		grapes	banana		orange banana	
Dinner	*	69	65	60	64	62	69
30′	62	73	61	61	63	66	74
60′	67	77	68	63	64	69	68
90′	64	69	72	64	65	67	67
Diet	chicken	chicken potato milk	chicken milk	lamb chop fried potatoes milk	tomato chicken potato PEAS Milk	creamed beef spinach milk junket	hamburger macaroni PEAS(few) milk
Ret.	*	61	65	55	65	56	57

* Count omitted by mistake. B R —before rising.
Name. W. R. (chief symptom—convulsive seizures at 3-week intervals, also mild headaches)

lergic (see negative tests with wheat, cane sugar and corn on December 16 and 18, which, in my experience, exclude sensitivity to cereals).

Accepting 60 as the normal low rate in this case, a rate of 73, at ninety minutes after eating egg seemed nonallergic. However,

the omitted count just before eating apple might well have been high (thus warning against egg), because at a later test with two apples the pulse rate did not rise above 66; hence, the much higher rates recorded after the mid-P.M. apple of December 8 were probably due to the eggs. In the circumstances, egg was not

TABLE VI

Date June	8	9	12	13	14	15	16
Pulse B R — B_t —	66 66 74 74 72	68 68 68 68 —	68 — 72 72 72	68 — 74 74 78	68 74 74 74 76	68 72 74 78 76	66 72 74 74 74
Diet	oatmeal cane sugar (headache)	coffee cream sugar	bacon coffee toast, milk sugar	toast coffee milk sugar	orange coffee sugar toast, butter	toast coffee coffee, cream sugar	toast butter orange coffee sugar, milk
Mid A.M.	72 72 70 70				78 76 —		
Diet	milk				milk		
Lunch	72 80 80 84	74 74 74 74	— 78 78 76	78 78 78 78	78 76 76 80	76 80 76 78	74 78 — —
Diet	EGGS	beef rice butter coffee cream sugar	milk	pork potatoes string beans tea, sugar bread	pork rice string beans bread butter	bacon milk bread butter Jello, cream	beef, rice string beans bread butter milk
Mid P.M.		74 74 76 76					
Diet		grapefruit sugar					
Dinner	74 80 80 78	76 76 72 72	— 76 74 76	72 74 74 78	76 76 76 74	76 76 — —	— — — 76
Diet	chicken rice butter milk	chicken peas, string beans, rice butter, milk	pork potato string beans bread, coffee milk, sugar	ham mustard coffee bread sugar	pork, rice green beans tomato bread, butter	beef, rice strings beans asparagus bread butter	chicken potato beans tea, lemon sugar bread, butter
Ret.	68	(well) 70	76	78	72	68	—

Name Mrs M O (aged twenty-six)

suspected and was eaten again on the next morning with orange —a new test. The resulting rise of the pulse rate was attributed to orange, and eggs were eaten again the next two days.

At this time it was seen that the normal low rate was not 60 but 55 to 56, which indicated a normal high point not over 70. Thus, the 79 after eggs on the morning of December 11 was

TABLE VII

Date Feb.	15	16	17	18	19	20	21
Pulse B. R.— Br.—	62 68 76 84 80	(vomited) 68 70 86 84 84	70 76 72 80 75	68 72 76 76 80	68 74 84 82 80	64 72 80 78 74	66 74 70 68 70
Diet	OATMEAL	GRAPE-FRUIT	goat's milk	goat's milk	OATMEAL SUGAR goat's milk "feeling sick at stomach"	goat's milk (feels well)	goat's milk
Mid A. M. headache nausea	84 80 72 80	80 84 88 82	86 84 77 76	72 72 72 72	70 80 76 72	74 74 74 76	74 80 78 73
Diet	MILK	MILK (vomited)	goat's milk (no nausea today)	carrot	tomato	tomato	tomato lettuce
Lunch	72 84 80 80	80 80 80 88	80 86 84 84	76 76 80 76	72 80 78 80	80 88 88 78	72 74 84 80
Diet	eggs *(vomited)*	LAMB chop	LAMB chop	egg	LAMB chop potato	BEEF potato	ham potato (walking)
Mid. P. M.	84 88 80 88	96 96 84 78	76 85 78 76	80 78 78 84		78 80 76 74	80 80 76 72
Diet	apple (vomited)	ORANGE	carrot	apple		carrot	banana
Dinner		81 80 92 96	88 84 88 96	88 88 84 76	88 80 80 80	78 80 70 84	76 81 80 80
Diet	no dinner (vomited)	chicken	BEEF potato	FLOUN-DER potato	ham carrot potato apple	ham potato apple	ham, egg potato goat's milk apple
Ret	90	75	96	72	74	76	78

Name Miss A. C M. (aged fifty).
Advised Vitamin B Complex, 4 caps daily

recognized as allergic and eggs could be suspected and eliminated.

In the meantime, carrot, beef, and tomato had come under suspicion, but retests of these proved them all to be nonallergenic (see tests of December 12, 16 and 18).

A most important lesson evident in this case is that while tentative guesses must be made as early as possible and *acted upon*, the *final* decisions must await a sufficient experience with the effects of single foods upon the pulse of the particular individual and especially the revelation of his normal pulse range. It frequently happens that this important constant cannot be ascertained until several days or longer after the trial diet has

TABLE VII (*Continued*)

Date Feb	22	23	24	25	26	27	28
Pulse B R — Br — slight headache	70 72 76 80 80	68 75 80 80 82	66 72 85 80 80	66 70 80 80 78	66 70 80 76 76	64 68 76 76 76	68 72 72 76 76
Diet goat's milk		goat's milk banana	goat's milk dates	goat's milk dates	prunes beet sugar goat's milk	prunes goat's milk beet sugar	prunes goat's milk beet sugar
Mid A.M	72 72 70 68	72 76 74 76	70 76 72 72	68 72 72 72	72 72 72 74	76 72 68 68	76 76 72 72
Diet tomato		tomato	tomato	tomato	tomato	tomato	tomato
Lunch	68 76 76 76	84 85 80 80	72 80 76 72	72 80 80 72	74 82 80 76	76 80 76 76	76 76 76 72
Diet eggs potato		ham egg potato	eggs carrot white potato goat's milk	eggs white potato carrots goat's milk	boiled eggs potato carrots (restaurant)	eggs potato carrots goat's milk	eggs baked sweet potato carrots
Mid P.M.	80 76 72 72	80 80 72	70 76 76 76	72 72 72 72	72 76 76 72	76 76 76 72	72 76 76 76
Diet banana		banana	dates	dates	raw prunes	raw apple	raw apple
Dinner	80 84 84 84	80 82 84 80	78 80 80 80	76 80 80 72	76 80 72 72	76 80 76 72	80 80 76 72
Diet FLOUNDER potato carrot apple beet sugar		SALMON potato carrot goat's milk	eggs peas potato goat's milk	eggs white potato carrots peas butter	eggs potato string beans peas goat's milk	eggs string beans white potato spinach goat's milk	eggs white potato string beans spinach
Ret	72	75	72	72	76	78	76

Name Miss A C M

been started. Rinkel has reported carry-overs (from a single test, if I did not misunderstand him) lasting as long as four or even five days. I have frequently observed a similar effect on the pulse-rate lasting five days. The difficulties of interpretation under such a circumstance are easily comprehensible.

The tests with egg, bean and pea were not followed by symptoms which could have served to identify those allergens. Thus the record of W. R. illustrates the advantage, which is frequently experienced, in depending upon the criterion of specific acceleration of the pulse rather than upon the occurrence of other symptoms in identifying the allergenic foods.

This point is illustrated also in the record of Mrs. M. G. (Table

VI), whose chief food-allergic symptom was recurrent severe headache and whose only food allergen is egg. This patient had been eating egg daily up to and including June 7. The single test on the 8th caused a significant acceleration of the pulse rate but no headache. After a day of abstinence from egg (June 9) a moderate exposure to that food on the 10th (roll glazed probably with egg white) was again followed by tachycardia (96) accompanied with headache.

The elevated blood pressure, 142/90, dropped in two days to 118/74. Egg has been avoided since June 10 and there has been no recurrence of headache.

As has been explained in the foregoing illustrations and by inference in the earlier reports, the allergenic foods and inhalant allergens are regularly identified through the criterion of specific acceleration of the pulse. Exceptionally, the occurrence of other allergic symptoms is helpful when the meaning of the pulse record is not clear. An instance of this fact is seen in the record of Miss A. C. M. (Table VII), whose chief symptoms were migraine (left) with vomiting, marked tiredness and constipation, there was also chronic rhinitis, neuralgia, and occasional dizziness. The allergenic foods in this case are cereals, cane sugar, citrus fruits, beef, lamb, fish, cow's milk, and yeast.

On a mixed diet on February 14, the maximal pulse rate was 100, ninety minutes after dinner. The abnormally low rate of 62 before rising on the 15th seemed to indicate a rapid recovery from the allergic reaction of the previous day. The bad headache and nausea beginning about a half hour after the taking of milk was thought to be possibly due to milk, but the *lessening* pulse-rate did not confirm this idea. On the 16th, vomiting again followed the ingestion of milk but again with no very impressive tachycardia, due perhaps to the previous eating of the minor allergen grapefruit. It was an unfortunate accident that the patient ate four allergenic foods on that day.

Since my personal experience had shown that most persons who are nonreaginically allergic to cow's milk can tolerate goat's milk, it was decided to try goat's milk in the hope of providing one nonallergenic food on which the patient could subsist while the systematic search for others could be pursued.

Luckily, goat's milk was tolerated and, as is seen in the subsequent record, the plan was successful. Lamb, carrot, beef, and potato were all under suspicion on the 17th, but carrot was cleared on the 18th, as was egg also. Apple and fish were suspected on the 18th along with potato. The test with oat and cane sugar on the 19th turned definitely against these and this was amply confirmed later. Tomato seemed clear on the 19th (confirmed on the 20th) but lamb, with potato, followed, rather late, by a pulse of 88, seemed still suspect. Ham, potato, and apple looked safe at dinner on the 19th. Beef was suspected at lunch on the 20th (no later test). After the clearing of potato, beef and lamb were placed definitely on the forbidden list. All foods eaten on the 21st were considered safe, the two rates of 84 being considered a carry-over effect.

The moderate acceleration of the pulse (84) after dinner on the 22nd was believed to be due to the fish, although apple had not been definitely cleared and beet sugar was being eaten for the first time. The two rapid rates (84 and 88) at lunch on the 23rd were almost certainly a carry-over effect from the previous evening. The rates of 82 and 84 after dinner were believed to be caused by the salmon, and the acceleration (86) after breakfast on the 24th was interpreted as carry-over.

Subsequent tests of new foods were undertaken cautiously for two reasons. The most cogent of these was the very severe, prolonged symptoms (vomiting, migraine) that followed the tests with cow's milk and that had to be feared as possible consequences of tests with other allergens. Another consideration was the importance of convincing the patient early of the dependability of the pulse rate as a criterion of allergenic and nonallergenic foods; a number of symptomless days in succession constantly associated with a normal pulse range (64 to 80 in this case) usually suffices for this purpose.

One is reminded here of the fact that the success of the specific treatment of nonreaginic food allergy depends largely upon the coöperation of the patient and his understanding of the theoretical basis of the treatment.

The subsequent course was uneventful. Five months later the patient reported that she had lost a total of $9^1/_2$ pounds of exces-

TABLE VIII

Pulse-Diet Record

Date Mar.	20	21	22	23	24	25	26
	Pulse	NOSE—DROPS		Stop drops			
B R.— Br.—	55 68 79 79 70	51 56 68 68 65	52 60 67 62 60	51 57 62 59 60	50 55 60 58 58	50 52 60 57 56	52 51 53 53 53
Diet	oatmeal toast sugar milk	shr. wheat grapefruit milk	same	same	shr wheat milk sugar toast	oatmeal milk toast grapefruit	same
Mid. A.M.							
Diet							
Lunch	63 63 64 63	64 60 59 59	57 60 58 58	57 60 60 59	58 59 57 57	52 57 58 57	52 53 54 53
Diet	eggs toast	toast milk	beef potato str bean roll, milk	beef potato cake ice-cream	fish str bean potato roll, butter	beef potato corn milk cookies	beef potato endive coffee ice-cream
Mid. P.M.							
Diet							
Dinner	63 66 — —	59 61 62 62	55 59 59 57	56 61 60 57	54 58 57 56	52 56 55 54	51 52 52 54
Diet	pork potato spinach str. bean cookies	scr. egg potato, pea toast milk cookies	chicken potato pea cookies ice-cream	chicken potato, pea lettuce Fr. dressing toast, cookies	egg biscuit chicken-soup milk	chicken corn toast milk	chicken bread, butter mayonnaise strawberry Jello
Ret.	59	58	53	56	58	52	51

Name: R. K. P.

sive weight. Four and one-half pounds had been lost in the first week (probably water of edema) and another three pounds gradually in the next four weeks. She was free of fatigue, constipation, headaches, and the chronic rhinitis. Her constantly split fingernails were healed. Her daily pulse range was 64 to 80. Final weight $129^1/_2$ pounds.

It is apparent that the solution of the succession of problems of interpretation presented in these cases was arrived at on the basis of the primary assumption that *all variations from the normal, both in the pulse-record and in the record of the other symptomatology,*

TABLE VIII (*Continued*)
Pulse-Diet Record

Date	Mar 27	28	29	30	31	Apr 1	2
Pulse B R.— Br —	50 54 58 59 54	52 52 55 59 56	52 53 59 58 56	51 53 57 57 55	54 59 60 59 57	51 53 58 57 57	50 52 59 — 58
Diet	oatmeal toast, milk coffee grapefruit	shr wheat toast coffee, milk grapefruit	same	same without grapefruit	shr wheat orange toast coffee	same	same
Mid A.M.							
Diet Lunch	57 53 56 53	53 54 54 54	54 54 53 54	53 56 56	54 56 55	54 56 56 55	53 55 53 53
Diet	chicken rice roll prune	beef potato bread str bean	fish potato carrot roll	grapefruit beef potato pea ice-cream	fish chowder crackers	salmon peas choc pudding milk	beef potato, pea lettuce avocado Fr. dressing ice-cream
Mid. P.M.			Cigarette 56 5' 57 15' 57 30' 55 45' 57 75' 54	Rye highball 0 54 30' 56 60' 57			
Diet Dinner	51 55 54 54	51 55 55 57	55 55 54 55	60 66 68 65	54 58 57 56	50 53 — —	55 53 54 53
Diet	chicken potato pea milk	chicken potato bean, Jello cookies milk	flounder potato bean, milk choc cookie ice-cream	beef consomme Fr fried- potato pea, ice- cream	flounder potato endive milk choc pudding	scr egg roll prune cookies coffee, milk	chicken- sandwich milk, cookie coffee-jelly
Ret.	53	—	—	60	54	—	53

Name R. K. F.

were specific allergic effects. The anxious 14-year search for a serious fallacy in this assumption has not revealed one such.

There are practical difficulties in the management of nonreaginic food-allergic patients besides those of interpretation of the pulse record. By all odds, the most disturbing of these is in the identification *and avoidance* of nonreaginic *inhalant* allergens. Sensitivity to "house dust" and tobacco is discussed elsewhere (see p. 156).

Other elusive inhalant allergens, the presence of which in one's immediate environment in effective quantity cannot always be detected by the patient, are cosmetic powders, perfumes, coal gas, soap powders, automobile exhaust fumes, fresh newsprint.

Unfortunately, the nonreaginic sensitivity to the inhalant allergens is seldom if ever extinguished by the operation of sympathectomy.

Another difficulty is sometimes encountered in patients who neglect to inform the diagnostician about their use of some extradietary materials (toilet articles, drinks, sweets). One patient with severe angioneurotic edema of feet and legs omitted for about a week to report her use of Aspergum, which turned out to be the sole cause of her allergic disability (no recurrence in the many years that have intervened).

A puzzling case was that of R. K. P., whose regular matutinal use of mentholated nose-drops remained unknown to me in the first days of his dietary course. His early pulse-diet record is shown in Table VIII.

In the preliminary period in which R. K. P. had used an unrestricted diet, two meals had been eaten containing cereal, milk, egg, and citrus fruit, the pulse ranging after those meals between 51 and 61. Hence, it was considered certain that the rates above 61 on March 20th, 21st, 22nd, and 23rd were due to some extradietary allergen. The use of the nose-drops was not reported until the 23rd, and then only under persistent questioning of the patient regarding his morning habits. The normal range was later found to be 50 to 60, the daily maximal rate varying between 58 and 60, with an occasional 57.

The normal pulse-rates observed after smoking and the drinking of rye whiskey illustrate the lack of pulse-accelerating effect of these materials (and the presumable lack of other serious damage to the tissues) in persons not allergic to them.

A serious difficulty that is not uncommon is the finding that the patient is sensitive to a large number of important foods. Happily it has been found possible to minimize this difficulty through a conservative lumbar sympathectomy (see Chapter X).

CHAPTER V

The Idioblaptic Shock-Organs

A COMPLETELY SATISFYING explanation of the kaleidoscopically varying symptomatology of idioblapsis cannot be drawn alone from the basic immunologic principle of von Pirquet and Schick. The knowledge of that principle must be supplemented with an understanding of the equally important principle of the shock-organs (Doerr).

The idea of the "shock-tissue" and "shock-organ" has long been part of the concept of acute anaphylactic shock and that of the atopic allergy.

Incidentally, let us not forget the original recognition of the shock-tissue in the following statement taken from the monographic report of von Pirquet and Schick: "The essence of our concept lies in the fact that the immediate reaction and sensitivity on reinjection is an antibody reaction taking place in living tissue (vitale)" (p. 115).

Those investigators made no conjecture about which tissue is involved in the allergic reaction of serum sickness nor has the particular tissue since been clearly identified in any allergic state excepting contact dermatitis (the epidermal tissue).

The special problem of the idioblaptic shock-organs may be more sharply defined by contrasting it with the simpler conditions of the shock-organs of acute anaphylaxis.

The shock-tissue of acute anaphylactic shock in the three classical test-animals is nonstriated muscle and the shock-organ in the *three is that one in which the* physiological reaction (tetanic contraction) of nonstriated muscle is capable of interfering with a vital function—respiration in the guinea-pig, pulmonary circulation in the rabbit and hepatic circulation in the dog. The shock-organ of acute anaphylaxis is the same in all the individuals of any one species.

In human idioblaptic disease, on the contrary, the shock-organs are numerous and differently affected in different individuals. It may seem unlikely that familial nonreaginic allergic disease ever affects only one shock-organ in any individual, even in one exhibiting only one allergic symptom; and on the other hand it is not easily conceivable that all the potential shock-organs could be affected in one individual, although a small percentage of food-allergic persons suffer from all of the most common 11 symptoms.

Thus it is seen that just as in the atopic category[1] so also in the idioblaptic, the individual shock-organs are independently affected, no doubt also under a hereditary influence.

While most of these symptoms may occur at any period of life, some are seen more frequently in the young, others in later years. For example, chronic urticaria is quite common in the early decades, whereas essential hypertension with its consequent arteriosclerosis tends to strike in middle life and thereafter.

Most of the idioblaptic shock-organs are not affected symptomatically by the reaginic mechanism of atopy, but all of the several recognized atopic shock-organs (conjunctiva, nasal mucosa, bronchial mucosa and skin) are affected by the specific idioblaptic mechanism. This clearly established relationship is further defined as follows:

1. Hay-fever occurs only in atopic persons, whereas chronic rhinitis may affect the nonatopic.

2. I am not acquainted with any investigation as to whether idioblaptic conjunctivitis may affect nonatopic persons.

3. Nonreaginic bronchial asthma is generally reputed to occur only in atopic families, the evidence for an atopic inheritance of nonreaginic asthma being equal to that concerning the reaginic asthma.

All the nonreaginic cases that I have studied have been shown to be affected by the idioblaptic mechanism (specific pulse-acceleration).

Thus we have in asthma an allergic symptom that often is produced by an idioblaptic mechanism acting on an atopic shock-organ. Like bronchial asthma the cutaneous eruption known as

[1] Clarke, J. A., Donnally, H. H. and Coca, A. F · *J Immunol.*, *15* 9, 1928

"infantile eczema," "neurodermatitis," "atopic dermatitis" reputedly affects only persons of atopic lineage. However, in my experience many of these cases are relieved through avoidance of the pulse-accelerating allergens, just as in the instances of nonreaginic bronchial asthma. In fact the pulse-dietary method has not failed to solve any case of such dermatitis in which it has been properly applied.

The question whether certain allergens are prone to affect particular shock-organs of familial allergy has been informally discussed by some allergists. The special relationship of pollen allergens to hay-fever is obvious and "pollen-asthma" is also commonly observed. This localization of the reaginic pollen-symptomatology could be ascribed to the localized contact, but a case of persistent headache arriving each year about August 15 and lasting four to six weeks has been reported in a man without hay-fever or asthma by Dr. Loren Ake in Richmond, Ind.

This case suggested a purely idioblaptic sensitivity to ragweed pollen, which might be experimentally investigated with the criterion of specific tachycardia.

Hitherto, allergists have recognized only the reaginic, atopic sensitivity to pollen and they have made use exclusively of the cutaneous tests in its specific diagnosis. If the existence of nonreaginic idioblaptic sensitivity to pollen is suspected one would recognize it most clearly in its pure form or at least not too greatly complicated by a coincidental reaginic sensitivity and I have been astonished to find what may have been such an instance in the classic first description of "hay-fever" by John Bostock in 1819.

Describing his own case he begins with "a sensation of heat and fullness in the eyes, first along the edges of the lids—a discharge of tears—itching and smarting discharge of a thick mucous fluid"—an exact description of symptoms of nonreaginic allergic conjunctivitis, as I have observed them.

Bostock continues with mention of other symptoms that are typically idioblaptic—"general indisposition, a great degree of languor, an incapacity for muscular exertion, loss of appetite, emaciation—profuse perspiration, the extremities, however, being generally cold."

Then he writes, "The pulse is permanently quickened, from 80,

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Some years ago I submitted this question to Dr. M. Murray Peshkin of New York. Dr. Peshkin permits me to include his reply and the interesting illustrative case histories, which follow:

In reference to the evidence for the specific selective sensitivity of one shock-organ in a food-allergic person to a particular food while another food will cause evidence of sensitivity in another shock-organ but manifesting a different syndrome of allergy than that caused by the first food, I have selected several cases in children which prove the point in question

Allergen	No of Cases Pulse-Tested	No. of Sensitive Cases	Vaughan* Cutaneous Tests, Positive Reactions, Per Cent
House-dust	39	26 (66⅔%)	—
Tobacco	38	19 (50%)†	—
Egg	100	34	9 5
Wheat	100	32	24 0
Orange	100	31	5 0
Potato	100	30	9 5
Milk	100	29	14 0
Beef	100	27	2 0
Pea-bean	100	24	3 0–12.0
Chocolate	100	23	4.0
Plum	100	23	7.0
Fish	100	23	—
Sugar-cane	100	22	0 0
Pork	100	21	1 0
Lamb	100	20	—
Tomato	100	20	7.0
Cabbage	100	20	5 0
Onion, asparagus	100	19	6 5
Banana	100	19	—
Coffee	100	17	7 0
Fowl	100	16	—
Apple	100	16	—
Corn	100	14	4.0

* Vaughan, W T *Practice of Allergy*, Mosby Co , 1939, pp. 92–93.

† When making the report on "Cigarette-sensitivity" I had an impression that the estimate of a 50 per cent incidence was too conservative Granville F. Knight's later report gives a much higher estimated incidence.

Patients requiring sympathectomy because of too many food-sensitivities are not included in this survey

I can say that this occurrence is not particularly common However, when it does occur the manifestations of different syndromes are indeed striking The following cases I can cite as examples.

Case 1 P B , age 4, male, with a bilateral positive family history of allergy, shows the following hives from peas, lamb and apple; colitis with mucous stools from bananas and milk, Henoch's purpura from wheat. Tomato causes abdominal colic only. This case is of further interest in that dust by contact causes hives Beet causes nausea and vomiting.

the average standard, to about 100, and upon any considerable exertion it rises to 120 or more." In the absence of infection and other easily recognizable causes of tachycardia this is a pathognomonic sign of the idioblaptic reaction.

The Question of a Specific Relation of Excitants to Particular Idioblaptic Symptoms

Expressed in plainer language, the question is whether in the same person certain allergens may regularly excite one group of idioblaptic symptoms while other allergens tend rather to cause another group. However, this form of the question does not quite convey the idea of the specific relationship of the particular excitant to the particular symptom.

The problem is complicated by the possibility of a quantitative factor affecting the symptomatology, or the mode of contact (inhalation, surface contact, ingestion). There is also the disturbing observation that the same excitant sometimes causes quite different symptoms in the same person. Thus C. T. (Chart XI, page 40), when her sensitivity to sugar-cane suddenly emerged on December 2, manifested at first only dizziness, on the 3rd severe leg pains, on the 4th headache (an unusual symptom *in this* patient) and on the 5th allergic tiredness and nervousness. All of these sensations were due to the same allergen (sugar-cane).

Nevertheless the following observations over a period of years in one patient do suggest a specifically different localization of the allergic action of several inhaled excitants: exposure to tobacco smoke is regularly followed in this patient by severe heartburn within a few hours, sometimes before the next meal; this effect in turn is always followed by nocturia but no vertigo: inhalation of certain wood smoke never causes heartburn but is regularly followed, sometimes in the next morning, by vertigo with nausea: exposure to illuminating gas (two episodes) and to a certain automobile paint has been followed promptly by severe attacks of tachycardia with distressing extrasystoles, air-hunger and chest-pain lasting 24 to 48 hours and passing off suddenly; there was no vertigo with these attacks and no heartburn; polyuria occurred at an early stage of all these episodes (1 to $1^1/_2$ liters in 50 minutes) but without vertigo.

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Orange	100	31	5 0
Potato	100	30	0 5
Milk	100	29	14 0
Beef	100	27	2.0
Pea-bean	100	24	3.0-12 0
Chocolate	100	23	4.0
Plum	100	23	7.0
Fish	100	23	—
Sugar-cane	100	22	0 0
Pork	100	21	1 0
Lamb	100	20	—
Tomato	100	20	7 0
Cabbage	100	20	5 0
Onion, asparagus	100	19	6.5
Banana	100	19	—
Coffee	100	17	7 0
Fowl	100	16	—
Apple	100	16	—
Corn	100	14	4.0

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CHAPTER VI

The Symptoms of Idioblaptic Allergy

Postulates for the Identification of a Symptom of Idioblaptic Allergy

For the purpose of illustration in this discussion we may use two of the more common idioblaptic manifestations, recurrent headache and constipation. These were proved to be idioblaptic through the following criteria:

1. The idioblaptic pulse-character, present in all subjects.
2. Disappearance of the symptom upon avoidance of all pulse-accelerating materials.
3. Reappearance of the symptom and specific tachycardia upon deliberate or unwitting re-exposure to one or more of the identified materials.
4 Cessation of symptom and tachycardia upon further avoidance

All of the 11 more common symptoms of idioblapsis fulfilled these four postulates and this direct evidence was fortified by the circumstance that the affected individual usually exhibited more than one of the symptoms and that usually all of them disappeared and reappeared together. Exceptionally, re-exposure would recall one or another of the associated symptoms.

When any hitherto untested condition comes under question of an idioblaptic nature and if the four postulates are satisfied in even a few cases the results can be considered as acceptable, *provisional* evidence that the condition is idioblaptic. Incidentally it can be stated that with rare exception an idioblaptic symptom will always disappear within healing-time after complete stabilization of the pulse.

It is worth while to examine the implications of this conclusion. If, for example, the idioblaptic nature of essential hypertension is

Case 2. R. D., $9^1/_2$ years of age, female: Peas and eggs cause hives only. Nuts cause asthma and grapes cause asthma only. This patient is also a ragweed pollen case.

Case 3. K. K., 9 years of age, male: Wheat causes abdominal colic and salmon causes urticaria. This patient also suffers from hay fever due to grasses and ragweed.

Most Common Idioblaptic Allergens

In the first edition of this monograph "the eight most common culprit foods" among the first 31 completed cases were given as wheat, egg, milk, potato, orange, beef, tomato and chocolate. In the present survey of 100 cases other foods are found to have been nearly as often incriminated; but two inhalant allergens, tobacco and house-dust, far exceed any food in their incidence as idioblaptic excitants. The revised list of excitants in the order of their occurrence is presented in the table on page 65.

necessarily reflect the incidence of the symptoms in the population, since the patients were self-selected. The figures are of value as showing in how many instances the various conditions were proved to be idioblaptic through the application of the postulates cited above, wholly or in essential part.

Table X is reprinted from the report of M. G. Meyer.[1] The conditions listed represent the "chief complaint" for which the different patients were seeking relief.

Idioblapsis is a familial, constitutional disease exhibiting a protean symptomatology that merely reflects the various localization

TABLE X

Symptoms of patients in whom a successful result was obtained by the (pulse-dietary) method

Irritable colon syndrome	20
Peptic ulcer	2
Ulcerative colitis	1
Migraine	13
Ménière's disease	6
Chronic rhinitis	4
Retinal angiopathies	3
Urticaria	7
Epileptiform seizures	5
Paroxysmal tachycardia	5
Angina pectoris (with EKG changes)	3
Chronic asthmatic bronchitis	4
Emotional instability and depressions	8
Multiple sclerosis	2
Hypertension	24
Myalgias	3
Pruritus ani and Vulvae	6
Total	116

of the "shock-tissue" The affected area in a locality may be of remarkably small extent, for example, a single 2 to 3 mm hive or canker-sore or edematous spot in the macula of retina. In passing it may be noted that the primary gross pathology of idioblapsis thus far recognized as such *consists* 1) of edema under a pressure caused by obstruction of efferent lymph channels; and 2) of ulcer.

So many localities in the body have been known to be affected that no region can be safely assumed to be invulnerable. Not all

[1] Meyer, M G · *Ann Allergy*, 6 417, 1948

"provisionally" admitted on the basis of consistent reports from different observers comprising about 40 cases, such admission does not commit the physician to any hazardous measure, therapeutic or other, in the care of his hypertensive patient. Should the physician then withhold the diagnostic pulse-dietary survey from his hypertensive patient merely for the reason that only 40 subjects have been brought to safety with it? Moreover, he has no

TABLE IX

Symptoms recognized as idioblaptic in 95 patients. All symptoms were accompanied by tachycardia and all disappeared after elimination of the pulse-accelerating allergens

Symptoms	No of Patients Affected	Symptoms	No. of Patients Affected
1. Headache	53	20. Conjunctivitis	4
2. Tiredness	50	21. Angioneurotic edema	4
3 Indigestion	34	22. Chest pain	3
4. *Constipation*	29	23. *Diabetes*	3
5. Nervousness	28	24 Dysmenorrhea	3
6 Dizziness	23	25. Diarrhea	3
7. Neuralgia	20	26. Peptic ulcer	3
8. Canker-sores	19	27 *Underweight*	3
9. Heartburn	16	28. Abdominal pain	3
10. Eczema	15	29. Gastro-intestinal bleeding	2
11. Chronic rhinitis	15	30. Neurasthenia	2
12. Urticaria	13	31 Colitis	2
13. Hypertension	12	32. Gallbladder pain	2
14. Asthma	11	33. Angina pectoris	2
15. *Overweight*	9	34. *Epistaxis (frequent)*	2
16. Epilepsy	8	35. Enuresis	1
17. Irritability	6	36 Stammering	1
18. Hemorrhoid	6		
19. Depression	5		

"side-effects" to fear from the mere avoidance of a few foods, or tobacco, or "house-dust."

And I would press the same argument in the case of hemorrhoid (three successes, no *failures*), ulcer *(five successes, no failures)*, stammering with tic (one success, no failures), epilepsy (eight successes, one failure), angina pectoris, with EKG changes (four successes, no failures). In Table IX are listed the idioblaptic symptoms occurring in 95 patients who presented themselves for *the pulse-dietary survey*. The age of the patients ranged from three to 78 years with an average of about 39. The figures do not

Retinal detachment	Canker-sores
Cataract	Indigestion
	Abdominal pain
Essential hematuria	
Henoch's purpura	Urticaria
Cholecystopathies	Bronchial asthma
Peptic ulcer	
Colitis	Angioneurotic edema
Perineal pruritus	Acne

Allergic Rhinitis (Sinusitis) and Nonreaginic Bronchial Asthma

The problem of nonreaginic bronchial asthma and the commonly associated condition sinusitis has long been a matter of concern to allergists and to allergy-minded otolaryngologists. The so frequent occurrence of chronic rhinitis with nonreaginic bronchial asthma has suggested a causal relationship between these two conditions, which is generally accepted.

This by no means negligible group of bronchial asthma is described in the following far-sighted passage quoted from the section on Asthma. by Matthew Walzer, in the book on *Asthma and Hay Fever* (Charles C Thomas, publisher).

> There are many cases who clinically manifest typical signs and symptoms of bronchial asthma, but in whom hypersensitiveness as an etiologic factor seems improbable because the precipitating cause is not a specific one. These are the cases usually designated as of "infectious," or "reflex" origin, for no better reason than that the skin tests to all excitants in these patients are negative. Yet in every detail except this one, they may be indistinguishable from the sensitive cases In the clinical course of the illness, in the symptomatology of each attack, in the response to epinephrine and other medication, in the manifestation of blood and sputum eosinophilia, in the response to nonspecific forms of therapy, and in the positive familial and past history for asthma, hay-fever, eczema, and associated illnesses, they may not differ from the sensitive cases. The theory that they "must be" sensitive to bacterial proteins because they have not been found sensitive to anything else has never been substantiated. Although it may be advisable, for convenience in clinical consideration, to separate them arbitrarily from the sensitive cases and, because of the high incidence of chronic respiratory tract infection among them, to include them temporarily under a general heading of "infectious" asthma, this cannot be considered an admission that "bacterial" hypersensitiveness is their etiology or that they are fundamentally different from the sensitive asthmas.

The current views concerning this category of asthma have been discussed by Dr. Walzer in great detail in Chapter VII,

internal organs have been identified, even presumptively, as idioblaptic shock-organs. One may expect the liver eventually to be so recognized, but the answer for the spleen and the lymph nodes will probably be delayed, since their involvement need not result in characteristic symptoms.

A symptom of idioblaptic allergy may be recognized by the four postulates mentioned above.

It seems necessary to distinguish between symptoms and consequences of idioblapsis. For example it seems to be a nice semantic *question whether essential hypertension should be called* a symptom or a consequence of idioblaptic allergy; seeing that the *primary* effect of the allergy upon the kidneys is presumably an increased subcapsular *pressure* due to allergic edema, that the secondary effect of that pressure is an interference with the renal circulation (slowing), and that the hypertension represents actually a tertiary effect, which in turn may be followed by still another, namely arteriosclerosis.

In this connection it may be pointed out that common cold, a viral infection which would certainly not be called a symptom of idioblaptic allergy, is nevertheless with equal certainty a consequence *of that predisposing, constitutional handicap.*

Locke, noting the fact that the one constant, pathognomonic symptom of idioblaptic allergy is the specific tachycardia, refers to the other symptoms as "accessory."

It will be helpful to those intending to apply the method of trial-diet controlled by the pulse-rate in the treatment of food-allergic disease to know the clinical symptoms that have been thought to be food-allergic by earlier observers; these are:

- Stammering
- Epilepsy
- Psychoses
- Melancholia
- Rheumatism
- Arthritis
- Gout
- Ménière's syndrome
- Tinnitus aurium
- Corneal ulcer
- Allergic conjunctivitis
- Polyneuritis
- Myocarditis
- Cardiac arythmias
- Essential hypertension
- Dysmenorrhea
- Nasal obstruction
- Enuresis
- Headache (migraine)
- Chronic rhinitis

nasal drip and a purulent infection of the left frontal sinus, was found sensitive, through the criterion of the specific tachycardia, to cow's milk, orange, grapefruit, and egg. Intracutaneous tests with the respective extracts gave negative results but caused headache two hours later, with tachycardia.

Avoidance of these four foods was followed by cessation of the nasal symptoms (left nostril quite clear); but the purulent discharge from the frontal sinus continued for five months. The recurrent headaches and physical tiredness also ceased. Accidental eating of sufficient quantities of cow's milk caused recurrence of the swelling of the nasal mucous membrane together with tachycardia and severe headache (numerous tests). On February 24, 1941, x-ray examination showed all sinuses to be normal. Discharge had ceased and infection has not recurred. One may suspect that the occasional violations of his dietary restrictions were partly responsible for the delay in the healing of his infection.

Patient R. C. F., whose chief complaint had been frequently recurring left-sided headaches, had noticed that his left nostril was "often closed so that he could not breathe through it." With the criterion of specific tachycardia he was found sensitive to milk, wheat, chicken, duck, corn, nuts, and plum. Intracutaneous tests with extracts of all these foods resulted entirely negatively. Elimination of these foods from his diet was followed promptly by cessation of the headaches as well as other allergic symptoms and a permanent clearing of the nostril.

Patient M M. D.* suffers from reaginic sensitivity (hay-fever and bronchial asthma) to pollen, house-dust, and wheat, the reaginic nature of the sensitivity to dust and wheat having been shown through the indirect test in a receptive substitute. She also suffers from a nonreaginic sensitivity to potato, coffee, orange, and pork. An asthmatic attack is induced by eating pork or inhaling the fumes of pork being fried (many such experiences); also by eating orange. Her asthmatic attacks can be entirely prevented by strict adherence to the dietary restrictions indicated by the cutaneous tests (wheat) and by the study of the pulse-rate (pork, orange, potato, coffee). When she was eating these foods a

* For partial history of this case, see page 31.

pages 195–207, of the section referred to above. He stresses the fact that:

> Subacute and chronic infections of the upper respiratory tract, such as sinusitis, tonsillitis and adenoiditis, are almost universally believed to be important etiologic and contributory factors in the causation of asthma....

The first suggestion of the possible etiologic relationship of nonreaginic food-allergy to so-called "infectious asthma" came out of our experience with cases of chronic rhinitis.

Among the following nine illustrative cases the first four exhibited chronic rhinitis (sinusitis) only, while the other five suffered from asthma, three without sinusitis (M. M., J. J. V. and M. P.), two with nasal and sinus involvement (C. B. and P. W.).

Patient A. F. C. had been a life-long sufferer from chronic rhinitis (a so-called "mouth-breather," because of the constant obstruction of the nasal passages). He was advised by an otolaryngologist that there was swelling of the nasal mucosa and a right deviation of the septum. As a young man he experienced several prolonged attacks of spontaneous epistaxis occurring usually in the night.

Since the elimination of the allergenic foods from his diet, the nasal passages have been constantly free excepting short periods after retests of some of the incriminated foods, when other symptoms were also present.

Patient J. F. had suffered for the past 10 years from chronic rhinitis with constant "posterior nasal drip." Her local condition was diagnosed as "sinusitis" by Dr. Wm. L. Wheeler of New York City, who found the right antrum chiefly involved. Upon avoidance of the foods that caused tachycardia (lamb, chicken, egg, grape, grapefruit, tomato, chocolate, coffee, and prune) all these nasal symptoms, as well as the recurring headaches and physical tiredness, ceased. Fifteen retests with five of these foods caused on each occasion a recurrence of the nasal symptoms, together with the tachycardia and the other symptoms mentioned. The intracutaneous tests with all of the nine respective food-extracts, as well as many other foods and inhalants, resulted quite negatively.

Patient Dr. R., long a victim of sinusitis consisting of a swollen nasal mucosa which completely blocked the left nostril, a post-

nasal drip and a purulent infection of the left frontal sinus, was found sensitive, through the criterion of the specific tachycardia, to cow's milk, orange, grapefruit, and egg. Intracutaneous tests with the respective extracts gave negative results but caused headache two hours later, with tachycardia.

Avoidance of these four foods was followed by cessation of the nasal symptoms (left nostril quite clear); but the purulent discharge from the frontal sinus continued for five months. The recurrent headaches and physical tiredness also ceased. Accidental eating of sufficient quantities of cow's milk caused recurrence of the swelling of the nasal mucous membrane together with tachycardia and severe headache (numerous tests). On February 24, 1941, x-ray examination showed all sinuses to be normal. Discharge had ceased and infection has not recurred. One may suspect that the occasional violations of his dietary restrictions were partly responsible for the delay in the healing of his infection.

Patient R. C. F., whose chief complaint had been frequently recurring left-sided headaches, had noticed that his left nostril was "often closed so that he could not breathe through it." With the criterion of specific tachycardia he was found sensitive to milk, wheat, chicken, duck, corn, nuts, and plum. Intracutaneous tests with extracts of all these foods resulted entirely negatively. Elimination of these foods from his diet was followed promptly by cessation of the headaches as well as other allergic symptoms and a permanent clearing of the nostril.

Patient M. M. D.* suffers from reaginic sensitivity (hay-fever and bronchial asthma) to pollen, house-dust, and wheat, the reaginic nature of the sensitivity to dust and wheat having been shown through the indirect test in a receptive substitute. She also suffers from a nonreaginic sensitivity to potato, coffee, orange, and pork. An asthmatic attack is induced by eating pork or inhaling the fumes of pork being fried (many such experiences); also by eating orange. Her asthmatic attacks can be entirely prevented by strict adherence to the dietary restrictions indicated by the cutaneous tests (wheat) and by the study of the pulse-rate (pork, orange, potato, coffee). When she was eating these foods a

* For partial history of this case, see page 31.

sudden exposure to cold air or unusually vigorous exertion or laughter would usually precipitate an asthmatic attack; but these conditions have no such effect so long as she is avoiding those foods.

Patient C. B., aged 22, began in the winter of 1939–40 to experience continued "bronchitis" with occasional attacks of dyspnea. She consulted me first in April, 1940, on account of especially severe attacks occurring, she said, every time she entered the small animal house (rabbit, guinea-pig, mouse). She also complained of "sinus trouble," meaning a continual obstruction of the nasal passages, with muco-purulent discharge.

Scratch-tests with strong extracts of the dander of mouse, guinea-pig, and rabbit resulted quite negatively; the result with extract of house-dust seemed slightly positive. The usual series of weekly injections of increasing quantities of house-dust extract was administered and a dose of 0.1 ml of the undiluted extract was reached on May 29, this dose being given thereafter at three-week intervals. At that time the asthmatic attacks no longer occurred when the patient worked in the animal house, although there was a little sneezing on her visits there. However, the chronic bronchitis with occasional moderate dyspnea and the obstruction of the nasal passages continued and the patient again sought relief for this and for the consequent loss of sleep (in spite of her frequent use of "sleeping capsules").

The trial dietary regime was applied and within three weeks all of the allergenic foods in her diet—wheat, cane-sugar, egg, lettuce—had been identified. There has been no bronchitis, no wheezing, no dyspnea and not the slightest nasal obstruction since these four foods were eliminated. The pulse-rate, which, previous to the dietary treatment, had ranged from 72 to 100 dropped to a maximum of 72.

In the indirect tests in a satisfactory substitute, the results with egg and wheat were negative, and they were distinctly positive with lettuce, sugar-cane, and house-dust. The experimental eating of egg daily for over one week caused an acceleration of the pulse-rate to a maximum of 94; there were, however, no nasal nor bronchial symptoms in that period. Such a test has not been carried out with pure wheat. The eating of bread causes asthma.

Cane-sugar and lettuce cause both "sinusitis" and bronchial asthma, but although this effect is not demonstrably reaginic, it cannot be shown to be nonreaginic.

Patient P. W. had suffered from marked physical tiredness, nervousness, indigestion, attacks of dizziness, headaches, urticaria, canker-sores, sinusitis and bronchial asthma. In 1924, she had had an operation upon her right nostril at the Brooklyn Eye and Ear Infirmary on account of "sneezing spells." Shortly after this, she was admitted into the allergy clinic of the New York Hospital. I am indebted to Dr. Albert Vander Veer for the following notes:

The cutaneous tests to inhalants and foods resulted negatively. Mucopurulent material was found in the left antrum. Injections of increasing doses of bacterial vaccine with local treatment by Dr. Charles N. Harper were given from November, 1927, to May, 1928, the local condition of the patient not being consistently improved thereby.

The patient states that she has suffered from a nasal "infection" with post-nasal drip. She is unwilling to admit having asthma, although her wheezing on her earlier visits was audible at a distance and, on one occasion, her dyspnea was so severe as to require the injection of epinephrine. Her pulse-rate before dietary treatment ranged from 68 to 100. The asthmatic attacks and the nasal symptoms disappeared after the avoidance of the four allergenic foods (milk, egg, beef, and lamb). They have both recurred after deliberate retests or indulgences in these foods, but at no other times. At the retests, some of the first-named symptoms also have always recurred, especially marked physical tiredness and headache The normal pulse-rate after treatment has ranged between 62 and 78. Indirect tests in a receptive substitute resulted negatively with the four foods mentioned above, and also with house-dust, tobacco, and other common allergens—confirming the negative results of the direct tests done at the New York Hospital.

Patient J. J. V., aged 38, began to have asthmatic attacks at the age of 24. He exhibits also symptoms of nonreaginic food-allergy (headache, canker-sores, heartburn, physical tiredness and others); and he was found nonreaginically sensitive to milk, tomato, onion, potato, sweet potato, lamb, Lima bean, fish, oyster, tobacco,

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food-sensitivities were all nonreaginic; those in C. B. were both reaginic and nonreaginic. In all six cases the sinusitis was wholly relieved by mere avoidance of the foods that were identified as allergenic for the individual through the criterion of the acceleration of the pulse-rate

It may be fairly pointed out that the weight of this evidence is multiplied through the numerous subsequent retests of the several incriminated foods by each of these patients.

Of the five cases of bronchial asthma (C. B., M. M. D., P. W., J. J. V., and M. P.) the more significant, with respect to the present thesis, are M. M. D., P. W., and M. P. All of these patients have repeatedly suffered attacks of bronchial asthma immediately after exposure—by ingestion or by inhalation—to foods that cause acceleration of their pulse-rate as well as other allergic symptoms, but for which atopic reagins are not demonstrable.

Many allergists are inclined to consider the reagin-negative cases as *nonspecific*, that is, not due to any specific cause or causes. In criticism of this reasoning it may be recalled that the specific significance of the "positive" cutaneous reactions in hay-fever subjects was recognized and accepted by these same allergists long before their specificity was explained by the discovery of the atopic reagins

The lesson of this experience has been lost sight of by even those allergists who lived through it; and they turn away from the specific interpretation of the now hundreds of reported instances of symptoms following only the ingestion of or other contact with substances that were found to cause acceleration of the pulse in the respective subject. It will be seen that in all of the successfully studied subjects of atopic dermatitis reported elsewhere the causes of the condition were identified only through the acceptance of the specific significance of the recurring tachycardia and the avoidance of the respective foods or other excitants. Moreover, the cutaneous tests with the identified pulse-accelerating allergens causing the eczema were regularly negative.

It seems worth while to reiterate the facts concerning the etiology of bronchial asthma and neurodermite.

1. Both of these conditions are generally believed to occur only under the atopic familial influence.

coffee, chocolate, orange, fowl, apple, banana, cabbage, and celery. His serum sensitized normal human skin passively to dust, coffee, fish, and bean; *the tests with 13 of the other foods resulted quite* negatively. Tests with banana and oyster were not done.

The patient believes that asthmatic attacks have been caused by chocolate, coffee, fish, and tomato. He has carefully observed the dietary restrictions and has had no asthmatic attacks since January, 1941. He has had no medication of any kind since that date.

The following new case of bronchial asthma provides additional evidence pointing to the importance of the specific nonreaginic food-allergic mechanism in the causation of this symptom.

M. P., a young woman of 22 years, began to experience bronchial asthmatic attacks in December, 1941, having already shown symptoms of grass hay-fever.

The cutaneous tests revealed sensitivities to grass pollen, wheat, and house-dust. The pulse-controlled analysis showed sensitivity to cereals, citrus fruits, and dates. Previous to the dietary course, the pulse-rate had ranged from 66 to 108. After the incriminated foods had been avoided, the pulse-rate came to a constant level of 72, not varying from this rate throughout four consecutive days, after which regular pulse-counting was discontinued.

During this period and thereafter, there has never been any *indication that house-dust is a factor in the causation of* the asthma. Wheat (bread) has been eaten without restriction since the conclusion of the dietary course; also without precipitating an attack, but with constant accelerating effect upon the pulse-rate. On the other hand, asthmatic attacks have always followed exposure to citrus fruits, whether by ingestion or by inhalation of the fluid material in droplet form (several severe attacks after operating a machine filling an orange-flavored fluid). The cutaneous tests, scratch and intracutaneous, to grapefruit and orange resulted *negatively.*

Of the nine cases just described, six (A. F. C., J. F., Dr. R., R. C. F., C. B. and P. W.) exhibited more or less pronounced symptoms of chronic rhinitis (sinusitis), which was associated in two of them (C. B. and P. W.) with bronchial asthma. In five instances (A. F. C., J. F., Dr. R., R. C. F. and P. W.) the specific

was administered by Dr. Wallace Shaw, after which the pulse ranged generally from 68 to 84 with rises after egg (100), prune (104, coughing), banana (104), coffee (112, wheezing, nausea, frontal headache, heartburn), lettuce (120). The immediate, marked improvement permitted discontinuance of oxygen and all medication after 30 hours.

The block was repeated at 48-hour intervals three times. By September 15 the patient was sitting up and there was no wheezing. Her condition was considered favorable for the limited sympathectomy which was performed on September 16 by Dr. John H. Irwin and Dr. Louis Steinger.

The patient was out of bed on the second day and was discharged on the fifth day. Later a sensitivity to an unidentified environmental allergen emerged and the patient withdrew from my observation.

M. Man., age 39, had suffered bronchial asthma from childhood, positive cutaneous tests by New York allergists to feathers, cheese, cat, ragweed. Received "treatment" by injections of a solution "based on those tests and an analysis of her sputum." Incidentally the test with tobacco was negative; but the pulse is markedly accelerated in the smoking test and clinically the patient is exquisitely sensitive to tobacco smoke.

The patient first consulted me August 31, 1946. The pulse was frequently faster before rising than it had been *on retiring*, indicating a sensitivity to bedding-dust which was controlled with dust-proof covers

In the night just before the September period began (*14th* early evening) there was a severe attack of asthma with tachycardia continuing through the next two days and nights. Repeated injections of epinephrine (0.2 cc to 0.3 cc) seemed helpful though the patient frequently became frightened. The maximal pulse counts were 100 to 108, and the high counts continued two days after the asthmatic attack ended (16th).

On October 11, 1946, the first *day of* the period, she began to require more frequent injections of adrenalin; asthma with tachycardia became severe and unremitting in the next four days, and thereafter alarming. The period ended on October 15 but the asthma grew still worse and was only partially alleviated with

2. Both have been shown in some instances to be excited through the specific mechanism of idioblapsis, to the exclusion of the reaginic mechanism.

3. It has still to be proved that "atopic dermatitis" is ever excited exclusively through the reaginic mechanism; that is, by excitants that do not cause specific tachycardia in the individual. It has still to be shown that "atopic dermatitis" ever occurs in persons lacking the idioblaptic constitution.

These facts taken together suggest that more exact genetic study may cause us to recognize that a double familial influence is operative in the etiology of many cases of bronchial asthma as well as that of disseminated neurodermite.

Status Asthmaticus

Present knowledge of idioblaptic asthma suggests the question whether status asthmaticus (prolonged asthmatic dyspnoea that resists all commonly employed medication and is not specifically explainable on the basis of the cutaneous tests), is ever reaginic. The answer to this question must wait for a much wider experience among allergists with the practical application of the pulse-dietary technic. The principles of that procedure were applied with complete success in the two cases of status asthmaticus, which are now to be described.

M. Mac., age 71; bronchial asthma of "many years duration"; had consulted several physicians, including an allergist of standing. The latter reported positive reactions to dust, milk, prune, lemon, tea, coffee, fish. Since August, 1948, she has been under the care of Dr. Max M. Scharf, Brooklyn, who reports five episodes of status asthmaticus each requiring hospitalization. In the fifth, which continued five weeks, she was in shock position in the oxygen tent when I was called in consultation. At that time potassium iodide gr. 5 was being administered after each meal. Other medication comprised successively pyribenzamine, demerol and benadryl q. 4h.

In the first day, Sept. 6, on an exclusive diet of goat's milk the pulse ranged from 94 to 120. The next day on regular diet avoiding all milk the pulse ranged from 80 to 112.

September 8, 7:20 A.M. the procaine-stellate-ganglion block

All these experiences have revealed the idioblaptic nature of the so-called "infectious" asthma, and the favorable clinical results of the pulse-dietary procedure convey the assurance that a large percentage of these "refractory" cases can be "cured," without medication, through the practice of specific avoidance, controlled with the pulse.

It can reasonably be suggested that in the specific diagnosis of bronchial asthma the skin-tests be performed with the "scratch" technic and that they be limited to the inhalant excitants; furthermore, that the practice of "nonspecific therapy" by injections be abandoned.

adrenalin 0.2 cc frequently repeated through the night of the 16th till morning when it suddenly ceased. It was then recalled that similar episodes had occurred at the two preceding periods.

In the meantime the pulse-dietary survey had revealed no pulse-accelerating foods. The patient had not smoked from the beginning of the survey.

In view of these circumstances and the fact that neither she nor her husband desired more children it was decided to induce premature menopause through 10 x-ray treatments. These were begun October 25, 1946.

The November period began on the 13th with tachycardia and asthma and lasted 17 days with one four-day interruption during which time asthma was mild or absent. The December period began on the 7th with mild asthma and tachycardia on the 10th and 11th. At the calculated time for the January period there was no flow but some wheezing. Thereafter there has been no period nor asthmatic attack, although there has been occasional wheezing due to environmental excitants, which have been largely avoided.

It should be recorded that slides exposed on the last two days of the status showed no ragweed pollen but "few hazel pollen on one day and occasional fungus."

Comment

Sixteen sufferers from bronchial asthma have presented themselves for specific diagnosis with the pulse-dietary technic and completed the survey. All of these had had conventional treatment, by injections, based on the results—positive or negative—of the skin-tests; and such treatment had failed in all of them.

The pulse-dietary course, sometimes with sympathectomy, was successful in the permanent relief of the asthma in all but one case. The exceptional case, after sympathectomy, was free from food-sensitivities; yet irregularities of his pulse persisted, which were believed to be due to unavoidable inhalant excitants, either in his place of business or in his very unsatisfactory living quarters. His asthma showed little betterment, although the abolishment of his numerous food-sensitivities through the sympathectomy caused obvious improvement of his general health and cessation of his recurrent attacks of corneal ulcer.

Instances of severe headache following exposure to inhaled excitants have been reported.[3] However, only very few such instances occurred among the 53 cases included in this study; with two other important exceptions, all were free from headaches as soon as all their pulse-accelerating foods were identified and avoided. In some instances, after the pulse-accelerating foods had been avoided and headaches had ceased, the pulse still remained irregular and other symptoms persisted such as hypertension, neuralgia, attacks of dizziness, asthma and heartburn. All of these manifestations could be shown to be caused by inhalant allergens and they disappeared after those allergens were identified and avoided.

The two "exceptional" cases were women suffering from "migraine," which was especially severe at the menstrual periods. The first of these was a young married woman who was found allergic (pulse-acceleration) only to citrus fruit. After avoidance of these there were no headaches between the periods, but the periodic attacks have continued. The second occurred in a married woman of 43 with family, who suffered an attack "at least once a week," and "always on the third day of the period." Pulse-accelerating foods are beef, egg, cheese, coffee and molasses; she also avoids tobacco smoke and gasoline fumes, which cause nausea. After avoidance the pulse ranged from 76 to 84, excepting at the next period (Oct. 17), when it reached 98 on the second and third days When the headache began on the afternoon of the third day she took one tablet of ergotamine tartrate. Within 30 minutes the headache ceased but she had a violent spell of vomiting, and she became sleepy, dizzy, depressed, weepy. With a pulse of 98 she retired, becoming "more depressed." Benadryl is not effective and only makes her sleepy.

With her husband's consent and with the approval of other local physicians the patient decided to terminate her menstrual periods.

The series of 10 x-ray treatments of the ovaries began November 1. The next period began November 10 and the usual headache began November 13 at 7 P.M. but became "suddenly better" at 11 P.M. The December period began on the 3rd and the left-sided headache began on the 4th, with a pulse of 100 lasting only a

CHAPTER VII

Headache

53 Cases Preventively "Treated" with the Pulse-Dietary Diagnostic Technic

In this study no instance of headache due to brain-tumor or to trauma has been encountered; only the common nonorganic, noninfectious, generally intermittent headache is being considered.

Such headache affects a large proportion of the adult population, estimated at about 25 per cent. The 53 cases here reported appeared among 95 self-selected subjects, who usually requested the pulse-dietary diagnosis on account of severe idioblaptic symptoms other than headaches. The commonest symptoms complained of by these 95 subjects were abnormal tiredness 56, indigestion 34, constipation 29, "nervousness" (anxiety) 28, vertigo 23, neuralgia 20, canker sores 19, chronic rhinitis 15, eczema 15, urticaria 13, hypertension 12, asthma 11, overweight 9.

These and many other symptoms were encountered in various combinations with the headache, or without headache. In all of the 95 cases the characteristic allergic irregularity of the pulse-rate was found; namely, a range from low to high, of more than 16 beats per minute and a variation greater than two beats in the daily maximal rate per minute.

Many of these patients were given cutaneous tests with extracts of the foods that caused headache and tachycardia. These tests (some by passive transfer) resulted negatively excepting in the few patients of atopic lineage. And even in these exceptional cases the cutaneous reactions were frequently "positive" with foods that caused neither headache nor tachycardia and they were sometimes negative with foods which had been identified by both criteria as idioblaptic allergens. When these consistent discrepancies had been confirmed in a large series of thoroughly studied cases the cutaneous tests were discontinued.

Etiology. Warren T. Vaughan[3] writes that Lesné and Richet, Jr. (1913), were the first to suggest the allergic nature of migraine. Vaughan himself (1927) was the first to confirm that theory experimentally by "(a) the finding of positive skin-reactions; (b) relief of symptoms following avoidance of foods reacting positively and (c) subsequent induction of symptoms by the feeding of those foods which had reacted positively." He reported 48 per cent of the female subjects and 60 per cent of the male subjects relieved by avoidance. Sheldon and Randolph[4] (1935) obtained high percentages of relief with Vaughan's procedure. Rowe[5] (1937) using his elimination dietary procedure reported good results in 63.5 per cent and "fair" results in 19 5 per cent of his cases. However, he remarks that "*most adult patients fail to give satisfactory skin reactions to allergenic foods.*" (Italics are mine.) Rowe seems to have been the first to break with the allergists' creed, "No skin-reactions, no allergy." Westcott (1934) is of the opinion that 35 per cent of subjects of migraine are allergic. Only Rinkel (1933) "denies that migraine may be primarily an allergic condition."

Rinkel *did*, rightly, exclude migraine from the category of *atopic* allergy, and at the time he wrote no one was aware of the existence of the nonreaginic, nonatopic category of idioblaptic allergy. In the same discussion he remarked "Therapeutic trial is the *only* means of diagnosing migraine due to allergy." This conclusive test has now been applied with invariable success in the presently reported series.

My first reports concerning the pulse-dietary method were made in 1936,[8] 1939[9] and 1941.[10] Among the first 31 cases were 23 of severe headache, including eight of "typical migraine."

When one examines all of the just-cited literature one must be astonished at the exclusion of any mention of allergy as even a possible cause of headache from an authoritative presentation of the subject in a standard system of Medicine, as well as in a recent comprehensive article discussing it.

The criteria by which the allergic nature of the headaches (as well as all of the associated symptoms) in the 53 cases herewith reported was demonstrated, are comparable, though not identical with those used by Vaughan.

(1) All of the subjects manifested the idioblaptic pulse-char-

few hours. At the time for the January period there was no flow but flushes and chills; no headache. There have been no further attacks of migraine, but exposure to paint-fumes has caused a different kind of headache with nausea and swelling of the feet. She is no longer susceptible to colds and her blood pressure dropped from 150/90 before the course to 122/84 on October 30.

The patient's daughter, age 9, with a normal pulse-range of 72 to 84, suffered occasional migraine, and constant constipation. She was very susceptible to colds, losing seven weeks from school in the previous year from that infection. Tomato and cheese caused tachycardia of 112 and 116 respectively extending over three days; and her pulse was markedly accelerated also by pork, banana and mint. After avoidance there have been no headaches, nor colds, nor constipation, and her school-work has distinctly improved.

Discussion

The preventive "treatment" of headache as described in Chapter II of this book has been entirely successful, within the discretion of the patient, in all of the 53 cases.

The ideal result of the full method is the perfect stabilization of the pulse-rate, but in the great majority of the cases the avoidance of only the food-allergens is sufficient for a satisfactory relief, since headache is less likely to be caused by inhalant allergens particularly house-dust. It is true that tobacco-smoke sometimes causes headache and more than 50 per cent of allergic persons are tobacco-sensitive. However, the test for tobacco-sensitivity can be finished in 15 minutes and tobacco-smoke can usually be avoided by those who are markedly affected by it.

There are very few persons who are unwilling to exercise the "discretion" necessary for their relief. One such man's severe headaches, abnormal tiredness, "nervous indigestion" and neuralgia ceased entirely while he avoided tobacco—his only allergen. Nevertheless, he resumed smoking, with the explanation that the symptoms do not worry him so much since he has discovered their cause. Incidently it is noteworthy, in passing, that his psychological depression was found to be not the *cause* but an *effect* of his allergic symptoms.

dominal cause of his migraine. The surgeon accommodated the man, finding nothing abnormal.

The second class of conjectured causes of migraine enjoy a presently widening popularity under various names (neurological factors, psychological disorder, etc.). So, worry, nervous tension, nervous shock, hysteria, psychoneuroses are mentioned. One writer contributes, "Constant provocation by worry naturally suggests a basis of anxiety." And again, "Continuous headache over a period of weeks or months almost always means a psychological disorder."

Since some of the 53 successfully treated patients in the present series manifested the psychological disturbances just mentioned and were relieved of them as well as of their headaches, one may consider three possible conclusions: (1) the headache and the psychological disorder are independent, primarily allergic symptoms; (2) the headache is allergic and the psychological disorder a secondary manifestation; (3) the second relationship is reversed.

Summary

(1) All of 53 cases of the common, nonorganic, noninfectious, *generally intermittent* headache, about one-third of which were rated as "migraine," were found curable (within the patient's discretion) with the pulse-dietary procedure.

(2) Retests of these patients by ingestion of the pulse-accelerating foods caused tachycardia and headache as well as the associated idioblaptic symptoms (tiredness, indigestion, constipation, etc.).

(3) Cutaneous tests *regularly failed* to reveal the specific excitants of the headaches and were discontinued.

(4) "Psychological disorders" occurred with the headaches in some patients but these could *not have been primary* causes of the headaches since they also disappeared after avoidance of pulse-accelerating excitants and recurred upon re-exposure.

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acter; (2) all became free from headache and all of the associated symptoms after the pulse was stabilized by mere avoidance (medication was never used); (3) symptoms and tachycardia recurred upon ingestion of one or more of the food-allergens; and (4) both disappeared when the food-allergens were again avoided.

Since all excitants of idioblaptic allergy cause specific tachycardia in all the allergic individuals, and if all nonorganic, noninfectious headache is idioblaptic, the perfect stabilization of the pulse by avoidance must effect a cure in all cases. Consequently the actually one hundred per cent effectiveness of the pulse-dietary regime in 53 consecutive cases of such headaches encourages one to conclude that all of them will probably be found to be idioblaptic.

The smaller percentages of successes reported by all the earlier investigators were due to the less reliable tests of food- and inhalant-sensitivities which all of them used. However, it must not be overlooked that even with imperfect technics these pioneers were able to establish food-allergy as at least an important cause of migraine.

Headache is not a symptom of atopic allergy. This was indicated in the report of Rowe, cited above, that the skin reactions to the proven food-allergens are negative "in most adult patients." The partial success of Vaughan and his followers with the cutaneous tests was due to the accidental circumstance that the migraine which he studied happened to affect many of his predominantly atopic patients. Some of these patients exhibited "positive" cutaneous reactions to the foods which were also the major or sole excitants of their idioblaptic symptoms, including the migraine.

Writers who discuss the causes of headache mention two different classes of these, sometimes with categorical authority. The first class comprises other conditions that have themselves been recognized as symptoms or consequences of idioblapsis ("dyspepsia," constipation, high blood pressure). This theory amounts to ascribing one symptom of a constitutional disease to its other manifestations.

One of my patients, observing that his attacks of migraine were regularly accompanied by indigestion, demanded of a surgeon that he perform an exploratory laparotomy in a search for the ab-

CHAPTER VIII

Dermatologic Manifestations of Idioblaptic Allergy

IT IS A FACT that is already known to those dermatologists who are particularly interested in dermatologic allergy, namely, that the skin is *variously* affected by allergic disease. There are, indeed, some dermatologists who are convinced that the list of recognized cutaneous allergic manifestations will increase with further knowledge.

CUTANEOUS CIRCULATION

A phenomenon of general significance that is sometimes apparent to the unaided eye is the favorable change in some patients in the arteriocapillary circulation after avoidance of all the pulse-accelerating allergens.

Previous to treatment the skin and nails may be pale and variously sallow, depending upon the pigmentation, and the nails may show a tendency to become wavy and cracked. The base of the nail may become loose, exposing the raw, bleeding surface of the nail bed. The lips and the back of the hands may become chapped in winter and the thick skin of the fingertips at the sides of the nails may become cracked and bleeding.

That a deficient circulation is the chief cause of these latter lesions is evidenced by the fact that those of the hands can be in large part prevented or greatly improved if the patient merely keeps the hands quite warm at night by wearing soft and sufficiently thick cotton gloves in bed.

After successful treatment of the food-allergy the skin and nails become pink, the nails are no longer cracked, and the tendency of the skin to chap and to crack at the fingertips disappears.

In one case (A. F. C.) the feet, previous to treatment, were con-

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3. Severe urticaria in some affected persons *seems* to be caused by inhaled allergen ("bed dust" in one of the cases described). The history of Case 5 confirms this impression.

Case 1. January, 1940. J G., male, aged 36 Symptoms: incapacitating three-day headaches at one- to two-week intervals, frequent urticaria and angioneurotic edema, and heartburn. All of these symptoms ceased completely and permanently after wheat, cane-sugar and coffee had been entirely eliminated from the diet.

TABLE XI
Pulse Diet Record
Case 5.—C. G , aged fifteen

1944	Jan 12	13	14	15	16	17	18
	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse
B R.—	68	51	51	50	52	54	53
Br —	87	72	78	60	60	62	64
30'	79	84	78	58	63	63	66
60'	77	88	72	58	62	63	65
90'	78	83	72	57	63	63	68
Diet—	Shredded Wheat, sugar milk	toast milk	rice (boiled) salt	rice (boiled) salt	rice, butter egg, milk baked apple	rice, egg baked apple sugar milk	egg, rice baked apple sugar milk
Mid A M		88	65	59	65	62	
30'		72	72	61	65	63	
60'		64	70	60	64	64	
90'		64	74	60	60	74	
Diet—		apple	apple	apple	carrot	carrot	
Lunch—	75	68	78	68	60	63	88
30'	74	68	70	74	84	64	85
60'	74	68	68	58	74	65	67
90'	69	76	72	59	72	64	68
Diet—	liverwurst milk bread orange ginger-cookies	chicken, milk lettuce orange bread	2 eggs (boiled)	eggs (boiled)	veal rice milk baked apple	egg milk baked apple	egg milk baked apple
Mid P M	75	72	64	60	63		68
30'	75	78	74	60	62		66
60'	72	68	60	60	62		66
90'	69	61	68	60	63		68
Diet—	nothing	milk	milk	*milk*	baked apple milk		lettuce celery
Dinner—	74	74	64	60	63	65	68
30'	69	85	61	62	64	65	70
60'	65	78	61	63	64	76	69
90'	66	—	62	62	62	67	72
Diet—	chicken rice milk cornstarch celery carrot lettuce	nothing	chicken	chicken rice butter baked apple sugar cream	chicken, rice butter baked apple milk sugar	chicken potato milk baked apple	ham potato carrot milk baked apple
Ret.—	hives today 65	hives 72	hives 58	hives less 60	no hives after lunch 63	no hives wt. 129 68	no hives wt. 128 64

B R = before rising Br = just before breakfast

(*Table XI continued on following page*)

stantly cold in winter and were slightly frostbitten on one occasion. After treatment the feet have never been cold in winter, even when exposed to the lowest temperatures in the usual footwear (cotton socks).

Secretory Activity of the Sebaceous Glands

Some patients with familial nonreaginic allergy exhibit a constantly excessive secretory activity of the sebaceous glands, often associated with the development of comedones. In two patients this condition existed in a marked degree previous to treatment. Patient J. V., whose chief complaints were continual headaches, mild bronchial asthma and physical tiredness, characterized the condition of his nose with the expression "a grease-ball."

After successful dietary treatment the patient was relieved of all of his allergic symptoms, and the excessive activity of the sebaceous glands ceased.

In the second patient, also, the improvement in this respect was remarkable and permanent.

Chronic Urticaria

It is common knowledge that chronic urticaria may be due to the eating of certain foods. Naturally, the culprit food has been easily identified only when it was the only excitant and if it was *not too frequently eaten*. Naturally, too, the foods that were so identified have been thought to possess some special urticariogenic property, and they are actually so listed by some writers, who advise avoidance of all of them by sufferers from chronic urticaria.

Study of the five cases, presently to be described, with the criterion of specific acceleration of the pulse has brought the following tentative conclusions:

1. Chronic urticaria is at least frequently a symptom of familial nonreaginic allergy.
2. While it seems unlikely that any allergenic food will be found never to be urticariogenic, it is a fact that among the list of an affected person's identified food allergens, some foods always or frequently cause urticaria, whereas others do so much less frequently, if at all.

TABLE XI (*Continued*)

Pulse-Diet Record

	Jan 26	27	28	29	30	31	Feb. 1
	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse
B R —	52	52	52	52	54	53	52
Br —	58	57	59	59	65	60	60
30′	60	58	38	90	63	58	58
60′	67	59	57	86	62	60	59
90′	61	57	58	86	62	59	60
Diet	strawberries Ry-Krisp milk	peaches cranberry rice milk	cranberry rice milk sugar	toast (wheat) peanut-butter apple milk	rice milk orange	Ry-Krisp applesauce milk	grapefruit oatmeal milk sugar
Mid A M.—					61		
30′					58		
60′					58		
90′					59		
Diet—					orange		
Lunch—	61	58	58	88	59	60	60
30′	60	60	60	86	61	59	61
60′	59	59	59	87	60	61	59
90′	58	57	59	84	61	60	59
Diet—	egg, lettuce celery, milk butterscotch	chicken carrot lettuce, milk orange	egg celery lettuce milk	lamb chop carrot lettuce milk covered with hives, face swollen"	pork potato str bean celery, milk applesauce	chicken carrot lettuce celery orange milk	ham carrot milk orange
Mid P M	57	57				60	60
30′	58	58				59	59
60′	58	57				58	58
90′	57	58				59	60
Diet—	orange	orange				raisins	apple
Dinner—	58	59	59	78	60	59	60
30′	59	60	60	76	59	60	74
60′	58	61	59	76	61	59	69
90′	58	60	59	74	59	59	65
Diet—	chicken peas rice milk	squash potato lamb, lettuce Ry-Krisp peanut-butter	fish, squash tomato, onion celery, milk butterscotch	chicken egg rice, potato celery lemon milk	Ry-Krisp milk peanut-butter applesauce rice-pudding	ham asparagus turnip, rice milk	corn spinach pork potato oatmeal egg sugar lemon juice
Ret —	57 wt 126	58 wt 126	59 wt 126	68 wt. 126	59 wt 126 hives	— few hives	— no hives (head cold)

Case 2 May, 1940 Mrs A P, aged seventy. Symptoms marked chronic generalized urticaria ("dollar-size"), chronic cough, constipation, "heart attacks," fainting, weakness, tiredness, and occasional headaches. All of these symptoms ceased completely and permanently after the following foods had been entirely eliminated from the diet: beef, cow's milk, egg, corn, orange, olive, banana, yeast, proprietary laxative The normal pulse range was 70 to 74

Urticarial attacks, accompanied with tachycardia up to 100, were induced separately by the following foods. *beef, orange, banana, olive, egg, laxative, yeast, corn.* All other cereals and cane-sugar were tolerated without causing any tachycardia or other symptoms.

TABLE XI (*Continued*)

Pulse-Diet Record

	Jan. 19	20	21	22	23	24	25
	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse
B.R —	53	52	53	52	52	52	52
Br.—	65	63	62	—	59	59	59
30′	67	64	64	—	60	60	60
60′	66	63	63	—	59	58	60
90′	67	65	65	—	—	59	59
Diet—	banana egg, rice milk sugar	orange egg rice milk	grapefruit egg rice milk	no breakfast	Ry-Krisp banana milk	pineapple Ry-Krisp milk	pineapple Ry-Krisp milk
Mid A.M.—	68	64	63	60	58	60	59
30′	63	65	65	58	59	58	55
60′	60	62	64	59	60	59	57
90′	63	63	62	58	59	61	58
Diet—	dates	dates	dates	tomato	chocolate bar	banana	raisins
Lunch—	62	64	61	60	59	60	59
30′	63	65	60	61	60	58	60
60′	*64*	*63*	*62*	*59*	*61*	*59*	59
90′	65	64	61	60	60	58	58
Diet—	egg milk baked apple sugar	egg milk lettuce baked apple	egg milk baked apple	ham broccoli baked apple milk	lamb chop potato, carrot broccoli, lettuce celery orange, apple milk	egg pineapple lettuce milk	lamb chop lettuce milk orange
Mid P.M.—	64	64	60	59	60	58	57
30′	66	66	63	62	57	59	58
60′	64	63	60	61	56	60	57
90′	60	65	62	59	58	58	58
Diet—	*orange*	*prunes*	*prunes* peanut-butter	*prunes* peanut-butter	*tomato juice* sugar	chocolate bar	raisins
Dinner—	62	64	61	59	58	58	59
30′	67	61	62	58	59	60	61
60′	65	60	60	59	57	59	65
90′	62	62	62	60	58	60	60
Diet—	ham, potato carrot, milk baked apple	ham, potato carrot str. bean baked apple	fish potato carrot peas	lamb chop potato beets orange banana celery, milk	Ry-Krisp peanut-butter milk	lamb potato onion carrot lettuce parsley celery pineapple date orange, Ry-Krisp	fish potato onion tomato broccoli celery Strawberry milk
Ret —	61 wt. 128	— sore throat wt. 127	— sore throat wt. 128	— sore throat wt. 127	— sore throat "feeling sick all day"	— throat healed "*feels well*" wt. 127	— wt. 126

Headache, accompanied with tachycardia up to 110 but *with no urticaria nor* heartburn, was induced by wheat eaten in quantity at the three meals of the *test on one day. Heartburn without headache or urticaria and with a moderate* tachycardia (90) followed a single ingestion of cane-sugar (two tests).

Urticaria and angioneurotic edema with delayed headache and no heartburn followed the ingestion of coffee. There was only slight tachycardia (80); normal maximum 74.

Other cereals (rice and rye) caused no symptoms and only a slight tachycardia (80).

The etiological study of chronic urticaria is complicated by the occasional instances of spontaneous recovery, or of a lessening of the severity of the condition. This consideration prevented a definite conclusion as to the cause of the urticaria in the fourth case.

Case 4. A. McC., female, aged 32 First consultation, May, 1943. The patient exhibited none of the most common symptoms of food-allergy but complained chiefly of chronic urticaria, which was severe only in the night, regularly preventing sleep after midnight The pulse was erratic, ranging from 60 to 83, but the rates above the estimated normal maximum of 74 could not be ascribed to any item of diet. This fact and the constant recurrence of the nocturnal attacks suggested an environmental allergen, possibly bed dust or feathers.

Dust-proof covers were applied to bed mattress and pillows in June, 1943, and the nocturnal attacks immediately ceased. Thereafter, only occasional wheals appeared in the daytime and dermographism persisted.

In March, 1944, the dust-proof covers were removed, but thereafter there was no recurrence of the nocturnal attacks, although one or two wheals still appeared in the evening as before The pulse was still erratic.

Still not being satisfied with the improvement noted in the foregoing, the patient decided to undergo the conservative sympathectomy. The operation was done on June 27, 1944, and healing of the wound was rapid and uneventful. There was some pain in the thigh (inner aspect) on the side of the operation, which gradually disappeared.

There were a few hives on the day of the operation but none whatever at any time since

The pulse, which before the operation had ranged erratically between 65 and 84, now shows a normal range of 65 to 76 on a large dietary list. After an evening meal containing onion and parsley (offender not further identified), the pulse-rate reached 80 with carry-over effect to the same point on the next morning

Case 5 J Z, male, aged 19. For two months he had suffered nearly constant urticaria affecting all areas of the skin in a kind of rotation. Referred by Dr. F J. Vita, Cliffside, N. J., who had prescribed antihistaminic drugs without success Other allergic symptoms were headaches, indigestion and canker-sores He was very susceptible to colds

Pulse-dietary tests through eleven days disclosed only few foods that could be considered nonallergenic and the ganglion block was then performed.

Urticaria was present when the injection was given and the pulse-rate was 102 Immediately after the injection the pulse-rate was 84 and the itching urticaria disappeared. The Horner syndrome was present. However, there was a local cutaneous reaction to the novocaine, and the pulse remained for about three hours above the patient's normal maximal rate, 80, which also indicated allergic sensitivity to novocaine

During that day and the next the pulse was generally not over 82, with a definite rise (86 to 88) after strawberry. The block was repeated on the third day and on that day the test with corn raised the pulse to 90, at which time there was an outbreak of hives.

It is noteworthy that on the first day of the trial diet, exhibiting "large hives and a bad cough" on rising, the patient suffered no further urticaria, although she ate nothing on that day but beef, which caused an almost constant tachycardia reaching a maximum of 100, and which, some weeks later, at a single test, caused a severe urticarial attack. This again illustrates the depressing effect of continued allergic insults upon the reactive mechanism of a shock-tissue. Not all the shock-tissues are necessarily depressed at one time; this is seen in the fact that on that day there were, beside the tachycardia, "some coughing and dull headache."

Case 3. January, 1914. C. G., female, aged 15. Symptoms: chronic urticaria, recurrent headaches, physical tiredness, occasional dizziness, and canker sores. The patient became symptom-free after the range of her pulse had been brought to her normal limits (52 to 61) through avoidance of her three food allergens—wheat, beef and strawberry. Other cereals and raspberry cause no tachycardia and no other symptoms

Table XI shows the daily pulse-diet record of C. G. for the first three weeks.

The slowing of the pulse after the evening meal on January 12 suggested that no allergenic food had been eaten at that meal. Hence, the marked tachycardia occurring after breakfast the following day was not attributed to milk but to the wheat (toast), which had not been eaten on the previous evening but which had been eaten on the previous morning, when also there was a subsequent moderate tachycardia.

Wheat was last eaten at noon on the 13th when the cardiac shock-tissue was in depression from the morning reaction However, there was a marked, delayed effect in the evening (85), which continued in lessening degree through the next three days until it was overpowered by a fresh reaction caused by the eating of veal.

The urticaria which was present at the beginning of the dietary examination persisted into the third day, after wheat was eliminated.

The tachycardial reaction to veal continued into the sixth day (62 on January 22), yet there was no urticaria at any time in that period, nor any other symptom.

In the following two days and in the third day until the evening meal (strawberry), the pulse-rate did not exceed the normal maximum (61).

Strawberry in two tests caused only a very slight tachycardia and no urticaria nor other symptom.

After another two days (January 27, 28) in which the pulse-range remained normal, a final test of wheat was made, resulting in a marked tachycardia, which lasted only 24 hours. The accompanying urticaria and angioneurotic edema continued for another day.

The tachycardia occurring after dinner on February 1 was believed to be an effect of the brief attack of common cold. The patient is not sensitive to corn.

There was a loss of four pounds in weight in less than four weeks—probably fluid.

Several years later C. G. reports that after every occasional indulgence in a food containing wheat flour (usually cake) there is a brief moderate itching and reddening of the face, but no urticarial eruption.

it was scaly and more or less inflamed, with shallow fissures. The average minimal pulse was in the middle forties indicating a normal maximum of 58-60. Only one pulse-accelerating food was found in the twelve-day survey—egg. Three days after avoidance of egg the dermatitis was "much improved." Two months later after strict avoidance of egg, the hands were "entirely well" The patient then began to eat cake and egg-noodles and two days later the itching eruption had returned "as bad as ever"

A little cake eaten at intervals of seven to ten days causes tachycardia (88) but no recurrence of the dermatitis, and no headache. The scratch-test with egg-white gave a negative result. Her family history for atopy is negative.

She reports that at each menstrual period there is itching of both hands lasting about ten days. No visible lesions appear at that time.

Case 3 Mr A L K., age 54, first visit August 19, 1946. His chief complaint was a generalized weeping eruption that required constant bandaging of *the arms* The condition had begun "two or three years ago," and since January, 1946, it had gradually spread and had grown more severe. Itching was negligible Folic acid 5 mg. daily was recommended and shortly thereafter the weeping ceased so that bandaging was no longer needed. However, the eruption persisted in the form of a dry, scaly thickening with signs of inflammation. It affected ears, arms, body and legs. This was the condition at the second visit on October 7, 1946 The pulse-dietary survey was started on October 8; the pulse ranged from 62 to 94 in the first week Specific tachycardia followed the eating of egg, fowl, fish, pork, beef, lamb, coffee, corn, potato, onion, and asparagus For protein he has depended thereafter upon milk, cheese, pea, bean, peanut and other nuts Improvement of the dermatitis was first noted on October 20, and there was marked improvement on October 25, and complete healing soon thereafter The patient's health has been otherwise improved. At his first visit his blood pressure was 180/108. Two weeks after the pulse-dietary survey was begun it registered 176/100 and his company physician found it 160/90, one week after that the company physician reported it as 156/86 and eleven days thereafter 128/78

At the time of his first visit the patient was decidedly undernourished weighing 140 lbs, height 5 ft 10 in Notwithstanding the sharp restriction of his diet he gained 12 lbs in the first three weeks and since that time he has gained additional 13 lbs reaching 165 (the normal weight for 5 ft 10 in at 54 years is 171).[1]

On February 17, 1947, the patient reported recurrence of the dry, scaly eruption on left hand, legs, and body. At that time the blood pressure had risen to 160/84. He stated that he had been indulging, during that time, in wine without making the customary pulse test, and agreed to discontinue the beverage.

On March 9, he reported that the eruption had again disappeared and that his company physician found a systolic pressure of 130. Since that date there has been no recurrence Aside from the folic acid, there has been no medication. The patient's son suffers from asthma; the atopic personal and familial history of the patient's wife is negative

Case 4 Miss E H, age 46, was referred by Dr Ivanoff, Stony Point, New York. Chief complaint "eczema" of hands, believed by Dr. Ivanoff to be allergic, the hands swell at intervals; the skin itches, hardens and peels; the nails turn white from the middle and new nail appears to form underneath.

[1] See Thomas D. Wood in Cyclopedia of Medicine. Volume 3, p. 525.

In these three days the pulse-rate was higher before rising in the morning than it had been on retiring, which suggested dust-sensitivity. Plastic covers were immediately applied to the bed-mattress and pillow. On the following morning the pulse was higher than before and there was an outbreak of hives. After a similar but worse experience on the following morning the plastic covers were removed.

Conservative sympathectomy (Irwin) was performed, the patient leaving the hospital on the fifth day, having avoided strawberry, corn and onion (his three residual food allergens) and having experienced no urticaria.

At home his minor sensitivity to dust soon showed itself in morning attacks of hives, and Dust-Sealing of the entire house was advised and carried out. The attacks then ceased.

The foregoing history again illustrates the value of conservative sympathectomy when food-sensitivities are numerous (see Chap. X); it presents an instance of urticaria, one of the specific excitants of which was an inhaled allergen, probably house-dust; it reports an instance of sensitivity to a plastic dust-proof cover necessitating the Dust-Sealing of *bed-mattress and pillows* as well as floor coverings and upholstered furniture.

Eczematoid Eruptions

Case Reports

Case 1. F. C. F., age 48, was first seen December 10, 1941, with dry, scaly, fissured dermatitis of the hands. The condition had been considered allergic, "positive" cutaneous reactions to nine foods having been obtained by an allergist. It is of passing interest that those tests had been positive with cod, crab, lobster and shrimp, but negative with blue fish, mackerel, catfish, salmon, scallop and clam. They were negative to all other meats excepting pork, but all of the meats excepting fowl caused specific tachycardia and the eating of beef especially was followed immediately by exacerbation of the dermatitis. Tachycardia also followed the ingestion of citrus fruit and yeast (as in beer or bread—all cereals were well tolerated). Influenced by the cutaneous tests, the patient has regularly avoided all fish. However, neither pulse nor skin was affected in two tests, by ingestion, with cod and flounder. Avoidance of the pulse-accelerating meats, citrus fruit and yeast was followed by a satisfactory improvement although the pulse was never perfectly stabilized. Two years later he reported "Hands clear but skin slightly congested, had a *bad* outbreak of eczema six weeks ago immediately after eating much beef." The patient's daughter has hay-fever.

Case 2. Miss R. S, age 22, was referred July, 1946, by Dr A S. Moscarella, Spring Valley, New York Her chief complaints were "eczema" of hands (several years, under various treatments) and recurrent headache. There were recurrences and remissions of the eruption, and improvement usually in the summer months.

The eruption was interdigital extending on to the palms and back of the hands,

The maximal pulse rate on the first two days of the pulse-dietary survey was 104. The interpretation of the pulse-record was greatly handicapped by an unidentified inhalant sensitivity (bedding-dust suspected). However, when the test with oatmeal was followed by a pulse-rate of 96 with headache lasting all day, all cereals were removed from the diet and three days later the patient reported healing of the eruption

This improvement continued notwithstanding the exposure to the environmental allergen. On the nineteenth day, dust-proof covers were put on the bedding. Since that date the patient has made no report, but Dr. Ivanoff stated four months later that she was quite well. The normal pulse was estimated to range from 72 to 84 There was a loss of about five pounds of excessive weight during the survey.

TABLE XIIb

Pulse record of Mrs E. E. on selected diet

	May 29	May 30	May 31	June 1	June 2
	Pulse	Pulse	Pulse	Pulse	Pulse
Before Rising		60	58	58	60
Breakfast		66	68	67	68
30'		67	60	69	68
60'		70	62	70	
90'		66	61	68	
Diet—		pep-cereal, coffee, bread	pep-cereal, coffee, sugar, bread	pep-cereal, coffee, cake	wheat-cereal, coffee
Lunch	62	64	66	64	
30'	63	66	66	66	
60'	68	69	68	68	
90'	66	68	70	64	
Diet—	apple lettuce mayonnaise	beef potato, carrot, onion, corn, coffee, apple-pie	lettuce, bread, mayonnaise, sardines, apple-juice, rice	carrot, beet, lettuce, mayonnaise, apple-juice	
Dinner	68	64	66	64	66
30'	62	62	68	68	68
60'	64	64	68	66	68
90'	60	60	66	64	64
Diet—	beef potato, corn, coffee apple-pie	lamb, tomato, potato, coffee, apple	tomato, lamb, potato, coffee, beets	ham, potato, carrot, apple, mayonnaise, coffee	beef, carrot, pepper, lettuce, potato, apple-sauce, coffee, mayonnaise
Retiring	60	58	60	60	62

Case 5. Mrs G. J, age 33, had experienced urticaria and occasional canker-sores, and was annoyed by overweight. Her chief complaint was a dry, scaling and peeling, fissured dermatitis of the hands. There was occasional itching. Her normal pulse-range was estimated as 62-74. Her food allergens and observed pulse-maxima are *sugar-cane* (92), corn (84), pea-bean (82), peanut (82).

These four foods were regularly avoided after March 11, 1946, and the dermatitis soon disappeared entirely. On September 24, 1946, she reported that her hands were still quite healed, and they have remained free since then, with one exception. On that occasion she tested cane-sugar once, and the dermatitis began to appear on the following day. She eats corn, pea and bean very seldom, and no dermatitis follows these single tests, although the pulse is markedly ac-

TABLE XIIa

Pulse record of Mrs. E. E. on an unrestricted diet

	May 11	May 12	May 13	May 15	May 17	May 19	May 20
	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse	Pulse
Before Rising	61	57	64	56	—	70	66
Breakfast	68	70	70	69	75	74	68
30'	75	74	73	78	71	74	76
60'	80	78	76	75	71	77	73
90'	76	71	81	73	62	72	69
Diet—	orange, coffee, wheat-cereal	pineapple, bacon, egg, bread, coffee, crab-apple jelly	apricot, bread wheat-cereal, crab-apple jelly, coffee	apple-sauce, cinnamon-toast, coffee, sugar	wheat-cereal, coffee, (fudge)	egg, grapefruit, wheat-cereal, apple-butter, coffee	egg, coffee, coffee-cake
Lunch		75	69	68	80	68	74
30'		69	65			76	
60'		75	74	78		78	
90'	69	71	82			74	
Diet—	beef, macaroni, tomato, lettuce, cucumber, vinegar, pepper, potato, coffee, butter	chicken, noodle, tuna-fish, milk, bread, lettuce, mayonnaise, olive, chocolate, pickle	tomato, potato, carrot, pea, cake, cream, wine	clam-chowder, liver-wurst	tomato, cheese, rye-bread, tea, cheese-cake	chicken, rice, cream-cheese, apple-butter, tea	beef, potato, tea, tomato, marshmallow, chocolate-pudding
Dinner	65	70	60	65	64	76	66
30'	69	73	64	66	68	78	69
60'	68	74	68	84	68	75	66
90'	63	69	62	65	64	72	—
Diet—	tuna-fish olive, tomato, celery mayonnaise, apple-juice potato	lamb, potato, barley, beets, pineapple, walnut-cake	lamb, barley, macaroni, spinach, celery, milk, coffee	beef, potato, milk, spinach, peach cake, cinnamon, coffee, sugar	ham, potato, carrot, apple, peach, cream, cake, coffee	mackerel, tea, potato, tomato, ice-cream	beef, potato, corn, coffee, chocolate-pudding, marshmallow

The maximal pulse rate on the first two days of the pulse-dietary survey was 104. The interpretation of the pulse-record was greatly handicapped by an unidentified inhalant sensitivity (bedding-dust suspected). However, when the test with oatmeal was followed by a pulse-rate of 96 with headache lasting all day, all cereals were removed from the diet and three days later the patient reported healing of the eruption.

This improvement continued notwithstanding the exposure to the environmental allergen. On the nineteenth day, dust-proof covers were put on the bedding Since that date the patient has made no report, but Dr. Ivanoff stated four months later that she was quite well. The normal pulse was estimated to range from 72 to 84 There was a loss of about five pounds of excessive weight during the survey.

TABLE XIIb

Pulse record of Mrs. E E on selected diet

	May 29	May 30	May 31	June 1	June 2
	Pulse	Pulse	Pulse	Pulse	Pulse
Before Rising		60	58	58	60
Breakfast		68	68	67	68
30'		67	60	69	68
60'		70	62	70	
90'		66	61	68	
Diet—		pep-cereal, coffee, bread	pep-cereal, coffee, sugar, bread	pep-cereal, coffee, cake	wheat-cereal, coffee
Lunch	62	64	66	61	
30'	65	66	66	66	
60'	68	69	68	68	
90'	66	68	70	64	
Diet—	apple, lettuce, mayonnaise	beef, potato, carrot, onion, corn coffee, apple-pie	lettuce, *bread*, mayonnaise, sardines, apple-juice, rice	carrot, beet, lettuce, mayonnaise, apple-juice	
Dinner	66	64	66	64	66
30'	62	62	68	68	68
60'	64	64	68	68	68
90'	60	60	66	64	64
Diet—	beef, potato, corn, coffee apple-pie	lamb, tomato, potato, coffee, apple	tomato, lamb, potato, coffee, beets	ham, potato, carrot, apple, mayonnaise, coffee	beef, carrot, pepper, lettuce, potato, apple-sauce, coffee, mayonnaise
Retiring	60	58	60	60	62

Case 6 Mrs G J., age 33, had experienced urticaria and occasional canker-sores, and was annoyed by overweight. Her chief complaint was a dry, scaling and peeling, fissured dermatitis of the hands. There was occasional itching. Her normal pulse-range was estimated as 62-74 Her food allergens and observed pulse-maxima are *sugar-cane* (92), *corn* (84), pea-bean (82), peanut (82).

These four foods were regularly avoided after March 11, 1946, and the dermatitis soon disappeared entirely. On September 24, 1946, she reported that her hands were still quite healed, and they have remained free since then, with one exception On that occasion she tested cane-sugar once, and the dermatitis began to appear on the following day. She eats corn, pea and bean very seldom, and no dermatitis follows these single tests, although the pulse is markedly ac-

celerated by corn and mildly so by pea and bean. She has lost 12 pounds of her excessive weight.

Cutaneous tests with the four pulse-accelerating foods gave negative results.

Case 6. L. M. P., age 61, was referred on May 9, 1916, by Dr. H. E. Bejack, New York City. This case has already been described (1) as an instance of an allergic manifestation excited by an inhaled allergen (powdered soap), among other things. The condition was diagnosed as allergic dermatitis and the diagnosis was confirmed by a dermatologist, Dr. Rosenbaum.

There was an itching, dry, scaly eruption of forearms, thighs (inner surfaces) and back of the neck (skin thickened), with angioneurotic swelling of cheeks and eyelids. At first, the pulse ranged from 54 to 97. The pulse-accelerating allergens were cereals, orange (itch), honey (itch), fowl, lamb, a popular shaving cream (pulse 108), and soap powder (exposure by inhalation caused itching and prolonged acceleration of the pulse). Within three weeks after the pulse-dietary course was begun, the eruption was healing everywhere and the angioneurotic edema had disappeared. The normal pulse-range averages 50 to 63 but slight contact with some inhalant allergens probably continues, raising the rate occasionally to 66 or 68. All the lesions eventually disappeared, leaving only a negligible perineal pruritus. The patient refused to submit to cutaneous tests.

Case 7. Miss A. G., age 23, was seriously annoyed by a constant eruption which appeared mainly as a bright red area on the right cheek, near the nose. There was also some scattered acne affecting the chin The patient's mother had suffered "eczema" of head and neck as a child.

The sole food allergen in this case (tomato) was identified on the second day of the survey by a maximal pulse-count of 107. The second test with tomato produced a maximal count of 92, after an earlier reaction to an inhalant allergen (gasoline).

Eight days after she began to avoid her one food allergen the eruption on her face was almost healed At home her normal pulse-range was about 72 to 81; but exposure to the motor-exhaust and gasoline (experimentally) caused a marked acceleration of the pulse as did some unidentified inhalant at her desk in a commercial laboratory (counts up to 108). These inhalants did not cause recurrence of her dermatitis

Case 8. Mrs E. E, age 32, gave an allergic history of urticaria (twice after having eaten shrimp), canker-sores, abnormal tiredness and headaches with vertigo. Her chief complaint was an unsightly and annoying eruption about the mouth and chin which was more pronounced at the time of the menstrual period, and was completely absent during her pregnancy. There were papular elevations set in flat areas of congestion, which varied in color from pale pink to rather "angry" red.

Over a period of 12 days the patient noted with more or less regularity the routine pulse-rates and the items of her usual diet. Part of this record is presented in Tables XIIa and XIIb.

The record is remarkable for the extent of the information it contains both as to the allergenic and the nonallergenic foods for this patient No less than 19 foods could be seen in Table XIIa to be probably nonallergenic (confirmed in Table XIIb) while six could be identified as most probably allergenic in Table XIIa.

Taking 56 provisionally as the lowest count and adding 12 beats as a possible,

normal range, produced 68 as the estimated normal maximal count. It was noticed that after dinner on May 11, 13, 17, and 20, the count did not exceed 68 or 69, which suggested that no allergenic foods were eaten at those meals. The patient was instructed to limit her diet to the items contained in those four meals, which she did on the five days May 29 to June 2. It is seen that on the three days on which the record was complete, the maximal rate was the same—70, indicating that no allergenic food was eaten on those days. The highest count on the other two days was 68, also indicating an allergen-free diet. The normal low count turned out to be not 56, but 58.

It is seen also that in a number of instances, the abnormally high counts could be attributed to individual foods in the respective menus, which are not included in the list of nonallergenic foods. Thus orange (Br. May 11), pineapple (Br. May 12), apricot (Br. May 13), cinnamon (Br. May 15), grapefruit (Br. May 19), chicken (L May 12; L May 19). It is noteworthy that this patient (like another who has confirmed the observation in several careful tests) can eat peach (D May 17), but not the closely related apricot. The patient continued to avoid five of the six items just mentioned, occasionally eating chicken which has not affected her skin. Her eruption gradually disappeared and it has not recurred in the succeeding two years.

Scratch-tests were carried out with concentrated glycerinated *extracts* (Lederle) of orange, pineapple, cinnamon, *chicken* and the glycerin-control solution. All of these tests gave negative results.

This patient did not consult a *dermatologist*, hence a dermatologic diagnosis cannot be offered.

Case 9. J. S., age 3; when seen on July 24, 1948, he presented a dry, scaly, fissured, itching dermatitis of the antecubital fossae, politeal spaces, neck and face, which had existed for about five months.

There was also marked exudative conjunctivitis affecting both eyes. The eyes were usually partially closed and the boy gave the appearance of being light-sensitive or perhaps irritated by mere movement of the lids. He cried frequently and was often irritable and willful. A pediatrician and two dermatologists diagnosed the two conditions as allergic and believed the excitant cause to be environmental. They disapproved of cutaneous tests in this case. The father suffers from hay-fever.

On the first five days of the pulse-dietary survey the *maximal* pulse-counts were 100, 108, 96, 104 and 110, respectively. Of the ten common foods tested in this period only one, banana, could be thought nonallergenic; but the pulse-counts at half-hour intervals *after* goat's milk were 78, 78, 82, 78 and 84; the eating of banana after the last count was *followed* by counts of 86 and 84, which suggested only a slight carry-over from strongly allergenic foods eaten on the previous evening.

On the sixth day, two lumbar sympathetic ganglia on the right side were removed with extraordinary ease by Dr. John H. Irwin of Englewood, N. J. On the third day thereafter the boy was apparently free of pain, his appetite was good and he was jumping about on his bed in his normal manner. Two days later he was placed in a nursery ward to play with other children and after five days there he was discharged. At that time the dermatitis still persisted and his conjunctivitis was "no better." Thus the operation of its ... effect

The subsequent conduct of the investigation of this case has been beset with difficulties; e g., exposure to offending inhalant allergens, an intercurrent infection, the boy's willfulness, which often prevented the pulse-counts and temperature measurements, and finally his eating prohibited foods given him by relatives and other persons.

The inhalants (dust and newsprint especially the colored comic sheets) were avoided without positive proof of their significance; the infection was controlled with appropriate chemotherapy (prescribed by Dr. Samuel Karelitz), and after *long observation*, with the important cooperation of the boy's nurse the few residual food-allergens (cow's milk, citrus fruit and banana, apple, pear, plum, peach, apricot) were identified and the *dermatitis and conjunctivitis cleared entirely. At this time he was given a banana.* Five hours later the right eye became markedly congested remaining so until the next morning. Twenty-four hours after he had eaten the banana there was a sudden outbreak of dermatitis affecting *only the face. This persisted into the night and by morning* it had cleared. Banana had not been eaten in the previous 10 weeks which could explain the absence of the usual pulse-reaction. When a small quantity of banana was again tested 10 days later the pulse rose *from 83 to 99 in about one hour* at which time there was itching (scratching) of the body and arms and an incipient red eruption of the face. The boy was crying and irritable. Four hours later the cutaneous manifestations were subsiding (pulse at half hours, 86, 85, 84, 85).

The weakness of the allergen of banana in this case is seen in the preoperative tests in which it was considered possibly nonallergenic. After the operation, goat's milk also was found to be allergenic (prompt exacerbation of conjunctivitis and dermatitis with pulse-counts of 112, 108 and 105 at 30 minute intervals).

The infection affected the pulse-rate, which interfered with the dietary survey, but it did not noticeably affect the allergic condition. The boy has remained well over two years.

Discussion

The determining role of the idioblaptic component of the etiology of the eruptions described in these patients is indicated not only by their relief in the successful cases, through the anti-allergic measures, but, more convincingly, in the recurrence of the eruption on exposure to one or more of the pulse-accelerating allergens.

The special technic of the pulse-dietary survey is time-consuming, requiring daily telephonic consultations. The interpretation of the pulse record in patients with sensitivity to numerous allergens requires experience. The intelligent coöperation and confidence of the patient contributes greatly to the success of the procedure. Expert examination of the home environment is often necessary for the identification and control of suspected inhalant excitants.

The new method has proved to be a valuable means for investigating the possible allergic nature of a number of diseases of obscure cause. The success of its application in the present short series may encourage dermatologists to extend its use in this fascinating field of research.

Allergy of Infection and Eczematoid Eruptions

Products of microorganisms, pathogenic and nonpathogenic, may act as idioblaptic allergens. One or two examples each will illustrate this fact. K T., whose outstanding allergic symptom was severe vertigo, noticed that injections of a "vaccine" of mixed pathogenic bacteria were regularly followed by particularly marked attacks. Allergists are aware that *some* asthmatic persons suffer marked asthmatic seizures following the injection of an "overdose" of vaccine of mixed pathogens

Ingestion of yeast, the micoorganisms of cheese and fermentative bacteria, frequently causes idioblaptic symptoms (headache, chest-pain, indigestion, etc.), but only in those persons whose pulse is accelerated by those materials.

Participation of infectious allergy in the pathogenesis of eczematoid eruptions has been independently studied by two experimenters, Hans Storck in Zurich and Frank A. Simon in Louisville, Kentucky.

In an extensive investigation admirably carried out with various bacteriological, immunological and clinical *criteria* Hans Storck reaches the conclusion that bacteria, probably through an allergic influence, "can be of great significance in the origin and course of eczemas" He repeats in other *words*, "the germs can play a partial, but also an exclusive role in the pathogenesis (of eczemas)." Storck's cases comprised, "*especially those forms* and conditions of eczema which have not been explained through the use of the patch-test with contact-substances." *Among these* was the condition known in this country as atopic dermatitis, which is known to be associated, through the inheritance, with hay-fever and bronchial asthma. However, Storck states "inherited idiosyncrasy appears improbable." *The* evidence adduced by Storck supporting *and* opposing this hypothesis is:

(1) Bacteria were found in many lesions, mostly *Staphylococcus* and *Streptococcus;* not in all—the exceptions remaining "unexplained." The greatest numbers were found in the weeping eczemas.

(2) The same bacteria occurred in the unaffected skin of eczema-patients and in the skin of normal persons, but usually in much smaller numbers.

(3) When broth cultures, usually of *Staphylococcus* or *Streptococcus,* or the corresponding sterile filtrates were applied to the skin-surface with a special technic, local reactions, which closely resembled the lesions of "eczema" grossly and histologically, were produced in a large proportion of the eczematous cases. Similar reactions were obtained in the "control persons," although in a considerably smaller proportion of the individuals.

The special technic consisted in lightly rubbing the culture-fluid into the skin, together with finely powdered glass-wool.

(4) Treatment of the infected eczemas with penicillin and other antibacterial medicaments was frequently followed by improvement, sometimes by complete healing of the eruption. Noteworthy is Storck's report that such improvement occurred also in cases of Salvarsan-Erythrodermic.

(5) The therapeutic results of attempts at specific desensitization through subcutaneous injections of staphylococcal filtrates, were, with isolated exceptions, disappointing. The commonly observed diminution of the allergic cutaneous reactions to the injected filtrates was usually not accompanied by improvement of the eczema.

While maintaining his thesis, stated above, Storck remarks: "Much is, however, still unexplained; time and nature of the sensitization and the participation of specific and nonspecific precipitating factors that lead to the outbreak of the eczema. Also the pathogenesis of the secondary (sterile) scatter-foci demands further research, as well as the possibility, through desensitization or increase of the cutaneous resistance of reinforcing the still unsatisfactory treatment with biotics and desinfectants."

Storck's report leaves no reasonable doubt that the secondary infections of the dermatitides which he was studying do more or less influence the course of the primary disease.

On the other hand his finding that marked eczema-like reactions occurred in 33 per cent of control persons (eczema-free) with cultures of *Staphylococcus aureus* makes it seem somewhat hazardous to identify those reactions etiologically with the lesions of the naturally occurring atopic dermatitis with its clearly marked familial character.

Simon's thesis has been that atopic dermatitis may be caused by an autosensitization of the affected individual to his own epithelium. This thesis was seriously shaken by Simon's admission that the cutaneous reactions which he obtained with extracts of adult human dandruff were not obtainable with extracts of human epithelium from the scalp of a foetus that had not been exposed to bacterial or other microbic contamination. The alternative explanation of Simon's reactions to human dander seems to be found in Storck's findings. The microorganisms in human dander to which the eczematous and normal skin is apparently sensitized are not so easily cultivated as was the staphylococcus in Storck's cases.

Simon observed a few cases in whom avoidance of the infected dandruff resulted in partial or complete relief of the eruption. However, the demonstrated idioblaptic nature of all of the eczematoid eruptions reported in this chapter permits the suspicion that those few cases of Simon as well as those of Storck were also primarily idioblaptic.

Weeping Eczema and Folic Acid Deficiency

In 1945 I reported three instances of a purely weeping dermatitis which was cured in all of them with a preparation of the *L. Casei* factor (folic acid) derived from liver Recurrence in these three cases was later prevented with synthetic folic acid in a daily dose of 5.0 mg.

A similar curative action of folic acid has been seen in two other cases which were of special interest because both patients presented different kinds of eruption only one kind of which was favorably affected by the vitamin—namely, the weeping lesions. In both cases there remained a dry scaly eruption after healing of the exudative lesions. One of these patients (A. L. K., see p. 97

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for full history) then received the pulse-dietary course following which the residual eruption was entirely healed.

After more than a year of freedom from their eruption under continued folic acid therapy all of the first three patients at different times suffered severe *temporary* relapse. The relapse in the first case occurred during an attack of "trench mouth"—both conditions terminating together. In the second case the weeping dermatitis, affecting chiefly the legs, recurred coincidentally with an attack of athlete's foot, which quickly yielded to local treatment with a solution of cadmium chloride. In the third case, also, the recurrent weeping dermatitis accompanied an infection—an unusually severe cold. The dosage of folic acid was not changed during these recurrences.

To the writer, one of the most notable conclusions to be derived from the data described in this chapter is that such different cutaneous lesions as urticarial and eczematoid eruptions can be manifestations of the same constitutional disease. This consideration would seem to invite the use of the pulse-dietary technic for the study of other clinically classified dermatitides of unknown cause.

Another consideration, of the nature of a paradox, one that really should give pause to some undiscriminating adherents of the skin-test, is the fact that the demonstrated specific excitants of urticaria and of the reported eczematoid eruptions regularly fail to cause specific reactions in the skin.

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Note: Much of the material constituting this chapter has been taken by permission from articles by the author published in the *Annals of Allergy, 3*. 101-109, 1945, and the *Journal of Investigative Dermatology, 13* 17–21, 1949.

CHAPTER IX

*Idioblaptic Diseases of the Alimentary Tract**

In his recent report, Meyer[1] remarks, "Gastrointestinal complaints, when functional, I believe, are all of allergic origin." My own experience in this symptomatic category is in agreement with that opinion, and the respective cases that are to be described below seem sufficient, to present separately as supportive evidence.

Canker-sores, which were first shown to be of allergic origin by W. L. Beecher,[2] have occurred in about 25 per cent of my food-allergic patients and have affected about the same proportion of high-school students, in a survey of 269 individuals. *They do not occur in nonallergic families*

The canker-sore would seem to serve as a useful analogy, both in its pathology and its demonstrated allergic cause, for speculation concerning the nature of peptic ulcer.

Ulcer has been suspected to be of an allergic origin and Rowe has reported six cases of "ulcer type of pain" among 150 cases of "gastrointestinal food allergy." However, Vaughan[4] excludes ulcer from consideration as primarily allergic.

Case Reports

Case 1 Dr P , age 46, under observation for some weeks by a prominent surgeon who had made the diagnosis of peptic ulcer, had been ordered to limit his diet to milk. The ulcer-pain had grown more severe and the surgeon advised resection. Learning from Dr. P. about his condition and his surgeon's advice and finding a pulse of 104 shortly after the last ingestion of milk, I suggested that he simply avoid dairy products and eat *any other desired foods.* After the first meal under this regime his pulse did not exceed 78, which remained the maximal count thereafter On the following day the ulcer-pain had disappeared but it recurred on three separate occasions shortly after the experimental ingestion of milk. After each of those tests the pulse-rate rose to more than 100

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Operation was, of course, no longer indicated and there has been no recurrence of symptoms in the succeeding seven years. Dairy products have been rigorously avoided.

Case 2. N. C., age 46, had suffered gastric resection for his ulcer with no resulting abatement of his symptoms. In fact these became so much worse that he was making arrangements for his retirement. Resorting, at last, to the pulse-dietary course he found milk to be his only pulse-accelerating food. Strict avoidance of milk was soon followed by disappearance of all gastric symptoms and of others equally serious, which will be described below.

Case 3. Dr. L., age 76, long a sufferer from duodenal ulcer (x-ray diagnosis), had been a life-long smoker (1 cigar and a number of pipefuls of tobacco daily). At the beginning of the pulse-dietary course Dr. L. stopped smoking entirely. In sending me his record, one month later, he wrote, "Since following this regimen—I have had *no stomach distress.*" On an unrestricted variety of foods the pulse ranged finally from 59 to 68-69—a normal range. Thus there were no food-sensitivities. The causal relationship of the tobacco allergen to the duodenal ulcer has not been experimentally established in this case.

Among Meyer's[1] series of 116 cases "in whom a successful result was obtained" with the pulse-dietary method are two of "peptic ulcer."

Indigestion and heartburn. In the allergy-questionnaire "Indigestion" has included gas-formation in the stomach, nausea, vomiting, and cramp-like gastric pain. These symptoms have frequently been referred to as "nervous indigestion." Heartburn is popularly known as "acid indigestion." Neither of these conditions affects nonallergic individuals and all those who are affected have been entirely relieved when the pulse has been stabilized through avoidance of all allergens.

Severe heartburn has been observed regularly to follow exposure by inhalation to the allergen of tobacco and that of fresh newsprint and carbon-paper in an individual whose diet is strictly limited to nonallergens. Some food allergens may regularly cause cramp-like gastric pain but never heartburn, on the other hand, the inhalant excitants of heartburn never cause cramp-like pain in the individual just referred to.

Constipation. In the early experiences with the pulse-dietary method patients were not questioned about constipation until several had, with astonishment, volunteered the information that they had become regular soon after the identification and avoidance of their food allergens. Some had been constipated as long as they could remember. Thereafter that symptom became a regular

item of the questionnaire. None of the marked cases of constipation has failed to become regular after stabilization of the pulse. Of the three cases of glaucoma reported by Berens, *et al.*,[2] as successfully treated with the pulse-dietary technic, all were constipated and all became regular.

Colitis. The first case in whom the pulse-dietary method was used was one of angina pectoris with gloomy prognosis. The attacks of angina ceased with the avoidance of pulse-accelerating foods (see also Meyer[1]) and at the same time a long-standing mucous colitis disappeared. Both symptoms have continued preventable in the individual throughout the succeeding 14 years. Occasional indulgence in pulse-accelerating foods is sometimes followed by a brief recurrence of the colitis and/or mild anginal pain.

Case 4 J C, age 19, suffered a sudden abdominal pain which was localized in the right lower quadrant. Other signs and laboratory findings pointed to appendicitis Operation revealed a normal appendix but an acutely inflamed colon The surgeon believed the condition to be allergic and the pulse-dietary tests found ginger to be the patient's sole allergen. Recently he had been indulging liberally in pumpkin pie heavily spiced with ginger. He was also fond of ginger-ale

Hemorrhoid. I have not been able to find in the literature any suggestion of possible allergic etiology of this rather common ailment (about 25 per cent of 230 adults were found to be so affected, children under 17 rarely).

Like many other idioblaptic manifestations, this was first suspected as such when it disappeared in an affected man soon after all pulse-accelerating foods had been identified and avoided.

Case 5 This person, age 68, with a history of over 40 years of migraine, severe indigestion and constipation, had first noticed *fresh* blood in the stool three years previously The bleeding gradually increased and later there was a more or less severe burning pain after each movement. Recently there had been a protrusion of a small mass with the more difficult eliminations

Having been found allergic to nearly all foods, he resorted to a conservative sympathectomy, which abolished his sensitivity to 15 important foods. Several weeks after the operation he realized that the symptoms caused by the hemorrhoid had ceased *and that* the mass which had been easily palpable had disappeared There have been occasional recurrences, always following violations of the allergic dietary restrictions, but none in the past *year* and a half of rigorous avoidance of allergenic foods

Case 6 A high-school teacher, age 42, director of athletics, complained chiefly of migraine and abnormal tiredness. His pulse-accelerating allergens are

pea, bean, peanut and tobacco. Avoidance of these was promptly followed by disappearance of the symptoms. At the same time he reported the disappearance of annoying symptoms that had been caused by an internal hemorrhoid. This was in September, 1946. This patient is also markedly allergic to paint fumes (heartburn, nausea, headache, irritability). During a month in which the interior of his school was being repainted he suffered a moderate recurrence of his hemorrhoidal symptoms. After the painting was completed the symptoms gradually subsided. The patient had consulted his physician, Dr. Isadore Gittelsohn of River Edge, New Jersey, at the first appearance of the condition. Dr. Gittelsohn has kindly permitted me to include his notes on the case which follows.

"In August, 1946, Mr G M., age 41, consulted me on account of a hemorrhoidal formation that he had first noticed about a month earlier. Examination showed the condition to be based near the mucocutaneous junction and lying within the rectum. There had been no noticeable bleeding, no pain and no protrusion The patient noticed only an internal sense of fullness and annoying discomfort when driving and especially at night.

"Surgery was not indicated and the nocturnal discomfort could be minimized with suppositories (anusol).

"Today (January 5, 1948) I examined the patient again. The hemorrhoid has completely disappeared. There is a small anterior fissure which causes him no discomfort. He states that since his first visit he has completed the pulse-dietary course, which you, Dr. Coca, have applied with some of my other patients."

Case 7. This patient, N. C., is referred to in the discussion of ulcer as formerly a sufferer from gastric ulcer. External hemorrhoids, which were intermittently very painful, appeared at the age of 12 or 13 years. In 1918 operation was performed and there was relief from the pain for about two years when the condition recurred. In 1923–24 bleeding began and in 1925 a second operation produced another two-year period of "betterment." In 1930 the external formations were joined by bleeding internal ones and two or three years later protrusion of the rectum began, which continued to worsen until January, 1946

At that time the patient's major food allergen (milk) was identified and excluded from his diet Bleeding gradually lessened as did also the extent of rectal protrusion. There has been no bleeding since April, 1947, and the rectal protrusion has become almost negligible. The formerly palpable internal hemorrhoids have been reduced so that nothing palpable remains of them There has been no constipation during the greater part of the hemorrhoidal affection. The patient concedes the primary allergic causation of his hemorrhoidal process but is inclined to consider changing local conditions, especially the varying consistency and quantity of the rectal contents, as significant contributory factors.

Out of the histories of these three instances of hemorrhoids can be formulated a rational theory of their etiology.

The idioblaptic nature of the condition is indicated in the permanent relief that followed avoidance of the pulse-accelerating foods in two cases and the sympathectomy in one. This evidence is supported by the recurrence of the lesion upon protracted exposure to an inhalant allergen (paint fumes) in one case.

One of the familiar primary lesions of food-allergy is a collection of edematous fluid, restrained in an area of greatly varying extent by an allergic obstruction of unknown nature, and subject to the vis-a-tergo pressure of the circulating blood. Common examples of this allergic lesion are the wheal, the swollen mucous membrane of chronic rhinitis and bronchial asthma, the meningeal edema of migraine, the glaucomatous eye[2] and angioneurotic edema.

If venous channels are included in the area of allergic edematous pressure the flow of blood from them can be restrained, causing their distention. When the hemorrhoidal area is affected, a circumscribed mass is produced consisting of distended veins and waterlogged interstitial tissue. When the allergic obstruction to the outflow of the fluid is loosed and normal lymph circulation is restored, pressure on the hemorrhoidal veins is released and the normal blood circulation through the area is resumed. This concept is, to be sure, based on circumstantial evidence. It is suggested as a "working hypothesis," which may serve to stimulate interest in the further use of the pulse-dietary technic for the relief of a distressing ailment.

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pea, bean, peanut and tobacco. Avoidance of these was promptly followed by disappearance of the symptoms. At the same time he reported the disappearance of annoying symptoms that had been caused by an internal hemorrhoid. This was in September, 1946. This patient is also markedly allergic to paint fumes (heartburn, nausea, headache, irritability). During a month in which the interior of his school was being repainted he suffered a moderate recurrence of his hemorrhoidal symptoms. After the painting was completed the symptoms gradually subsided. The patient had consulted his physician, Dr. Isadore Gittelsohn of River Edge, New Jersey, at the first appearance of the condition. Dr. Gittelsohn has kindly permitted me to include his notes on the case which follows.

"In August, 1946, Mr. G. M , age 41, consulted me on account of a hemorrhoidal formation that he had first noticed about a month earlier. Examination showed the condition to be based near the mucocutaneous junction and lying within the rectum. There had been no noticeable bleeding, no pain and no protrusion. The patient noticed only an internal sense of fullness and annoying discomfort when driving and especially at night.

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the sympathetic nervous system which was corrected only by sympathetic denervation of the kidneys. Nevertheless, the complete failure of the operation in many other cases has thrown doubt upon this concept and has caused some operators even to deny the conclusion so brilliantly supported by Goldblatt's experiments, that hypertension is essentially a disease of renal origin.

An explanation of these discordant results is found in the preliminary report[3] on the etiology of essential hypertension. All of the seven cases forming the clinical material of that report were subjects with nonreaginic food allergy, and in all of them the hypertension was reduced *pari passu* with the relief of the allergy, as judged by the lowering of the pulse-rate and the disappearance of the other allergic symptoms (headache, physical tiredness, etc.). When the allergenic foods were returned to the diet the blood pressure again increased—sometimes to its earlier maximum—diminishing again after elimination of the culprit foods.

It was tentatively assumed, on the basis of the Goldblatt experiment, that in persons with essential hypertension the kidney is a shock-organ of food-allergy and that the edema that is the characteristic lesion of the local allergic reaction causes an increased pressure within the kidney, which, in turn, compresses the blood vessels and thus impedes the flow of the blood through the organ.

It was also pointed out that in those cases of hypertension in which the slowing of the circulation is due to a narrowing of the vascular channels by infection (glomerulo-nephritis) or arteriosclerosis, the correction of an existing food-allergy could not be expected to influence such an irreversible lesion.

It seemed reasonable to suspect that the therapeutic result of sympathectomy could sometimes depend on which of these two conditions obtains in the particular case and this assumption is consistent with the negative results of the operation[4] in dogs in which artificial hypertension has been established with the mechanical method of Goldblatt. These negative results obviously prove that sympathectomy does not influence the physiological effects of renal ischemia; hence it would seem reasonable to assume that if the operation does relieve hypertension it probably

CHAPTER X

Sympathectomy as an Aid in the Relief of Idioblaptic Food-Allergy

SYMPATHECTOMY was employed as a therapeutic measure from the latter part of the 19th Century. It was applied locally for the relief of many symptoms, which at the time were not (and indeed still are not) generally believed to be due to the same cause; certainly not an allergic one, although some were conceived to be caused by some mysterious neurogenic "imbalance." The list includes Raynaud's disease, *thromboangiitis obliterans*, asthma, cardiospasm, constipation, migraine, paroxysmal tachycardia, neuralgia, angina pectoris, essential hypertension, chronic arthritis and epilepsy. Most of these have now been shown to be allergic, that is, they represent variously localized manifestations of a single, hereditary, constitutional disability.

The earlier experimenters proceeded according to their hypothesis that the symptoms were due to some local neurogenic abnormality ("imbalance of sympathetic and parasympathetic control"), and thus to the logic that the ganglionectomy should be done close to the supposed source of the symptoms and with meticulous thoroughness. Thus, for migraine and facial neuralgia the cervicodorsal ganglia are removed and the vertebral and carotid arteries may be stripped. For essential hypertension of supposedly renal origin, on the other hand, the splanchnicectomy of some surgeons is so extensive that the patient is incapacitated for three to six months.

Sympathectomy has been used most often for the purpose of combating circulatory hypertension, and its use in this condition has been empirical. It is true that the therapeutic success of the operation in many of the subjects with hypertension has led some to believe that this disease was due to some local abnormality of

the sympathetic nervous system which was corrected only by sympathetic denervation of the kidneys. Nevertheless, the complete failure of the operation in many other cases has thrown doubt upon this concept and has caused some operators even to deny the conclusion so brilliantly supported by Goldblatt's experiments, that hypertension is essentially a disease of renal origin.

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As Smithwick remarks, the symptoms that were relieved by the sympathectomy were not due to the hypertension because they sometimes disappeared even though the high blood pressure persisted (as was noted also by Peet, *et al.*). Those symptoms, especially headache, have since been shown[2] to be food-allergic.

Through the foregoing analysis, we arrived at the tentative conclusion that in the great majority of instances in which sympathectomy has relieved any human symptom, that effect was accomplished by some interference with the food-allergic reaction, wherever that reaction was located.

As soon as this conclusion was reached it was decided to apply that operation in the relief of the more serious symptomatic manifestations of familial nonreaginic food allergy.

To the best of my knowledge, the operation of sympathectomy as a consciously antiallergic measure was first performed on myself by Dr. Laurence Miscall at my request. As I was aware, the operation had been successful in some of the cases in which it had been employed upon an empirical basis for the reduction of hypertension; and I think it was my knowledge of that fact which was the most persuasive consideration impelling me to the operating table, because I had become convinced of the primarily allergic nature of hypertension.

My own history illustrates very well the nature of the antiallergic action of the operation as well as its limitations; and also in general it contributes to the very important practical conclusion that the maximal antiallergic effect is obtainable with the least transverse section of the main sympathetic chain that can be permanently maintained.

Through many years of trial and error, at first without, later with the use of the criterion of specific tachycardia, I had found myself clinically allergic to all available foods excepting beef. In ignorance of Stefansson's demonstration of the indispensability of fat for a man's nutritional requirement on an exclusive diet of meat, I ate only lean beef and rapidly lost both weight and appetite.

Table XIIIa presents the commoner of my allergenic foods in approximately the chronological order of their identification. For some months after they were first identified as allergens, the

does so through some influence upon the cause of the renal ischemia in that individual.

Now, the cause of the renal ischemia in human essential hypertension, as has already been stated above, is assumed to be a subcapsular food-allergic edema; hence the immediate effect of sympathectomy in the relief of such a case must be assumed to be some interference in the food-allergic reaction.

This conclusion has considerable support in several of the reports upon the results of sympathectomy in the treatment of hypertension.

Thus, Rowntree and Adson[7] in their report eighteen years ago of a case of malignant hypertension in which sympathectomy failed to affect the elevated pressure, observed:

"Headache and epigastric distress disappeared. Vision improved markedly; blind spots decreased materially."

Then, Crile,[2] in his early report of the results of celiectomy in twenty-eight cases of essential hypertension, wrote:

"In every case, symptomatic relief has been experienced; headache, palpitation, nervousness, etc., disappearing while the patients were still in the hospital."

Adson, Craig and Brown[1] state:

"Improvement in clinical symptoms is probably more manifest than the actual drop in blood pressure since these patients very promptly inform us that their throbbing headache, cardiac consciousness and precordial distress disappear."

Smithwick[8] writes:

"We judge the results on the basis of actual fall in blood-pressure level, and also on the basis of symptomatic relief. The latter is so striking and lasting, even in the absence of material blood-pressure change, that we are inclined to feel that *the improvement is the result of this type of operation rather than of temporary blood-pressure changes following non-specific operative procedure*." (Italics mine.)

Peet, Woods and Braden[6] comment:

"Many of the patients had blood pressures unchanged by the operation. To them, however, the relief of symptoms, usually headache, was of vital importance. The answer to this apparent paradox is not available at present. Research is being carried on by one of us (W. W. W.) relative to the physiology of cerebrospinal fluid pressure relationships in an attempt to explain *why, following operation, so many patients receive persistent symptomatic relief from their headaches even though their blood pressure continues unchanged or goes even higher.*" (Italics mine.)

As Smithwick remarks, the symptoms that were relieved by the sympathectomy were not due to the hypertension because they sometimes disappeared even though the high blood pressure persisted (as was noted also by Peet, *et al.*). Those symptoms, especially headache, have since been shown[3] to be food-allergic.

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Table XIIIa presents the commoner of my allergenic foods in approximately the chronological order of their identification. For some months after they were first identified as allergens, the

foods listed in the second, third and fourth columns could be eaten without symptoms at one or two week intervals. None of these was being eaten when the foods in the fifth column began to cause symptoms. The latter are in heavy type to indicate that shortly after daily subcutaneous injections of histamine were begun all three of them could be restored to the diet without any reaction.

In May, 1942, Dr. Miscall performed the first stage of the sympathectomy (Crile). Three right lumbar ganglia and the right half of the celiac ganglion were removed and 2.0 cc of absolute

TABLE XIII

Patient A. F. C.

a. *Nonselective tolerance for the sensitivities to the three weak food-allergens under daily injections of histamine diphosphate. The items in* **bold** *type could be eaten without allergic reaction during the period of the injections.*

wheat	rice	potato	**MILK**
pork	oat	peach-plum	**FOWL**
lemon	tomato	fish	**BANANA**
corn	lettuce	onion	
sugar-cane	cabbage (fam.)	spinach	
sweet potato	chocolate	carrot	
apple	orange	beet	
	pea-bean	grapefruit	
	peanut	egg	

b *Selective abolishment of food-sensitivities through sympathectomy The items in* **bold** *type have been eaten without allergic reaction since the operation*

wheat	rice	potato	milk
PORK	oat	peach-plum	**FOWL**
lemon	**TOMATO**	**FISH**	**BANANA**
CORN	lettuce	**ONION**	
sweet potato	cabbage (fam)	spinach	
apple	**CHOCOLATE**	carrot	
SUGAR CANE	orange	beet	
	PEA-BEAN	grapefruit	
	PEANUT	**EGG**	

Note: These food-allergens are arranged in groups in the order of their recognition as excitants and/or their elimination from the diet.

alcohol were injected into the left half of the celiac ganglion. Three and a half months later, the second stage of the Crile operation was carried out.

After the first operation, the following symptoms disappeared without need of any restriction of the diet: migraine, gastric pain, gastrointestinal bleeding, constipation, hemorrhoids, chronic rhinitis and lapses of memory. There remained tiredness, neuralgia (occipital and sciatic) with occasional numbness of ulnar nerve

distribution and hypertension (up to 190/122); also canker-sores, heartburn and mild conjunctivitis.

It is noteworthy that the residual symptoms were not perceptibly modified by the second operation which was done in August, 1942. This observation caused me thereafter to recommend only the most conservative procedure—removal of only three lumbar ganglia on one side. With one exception, all of my operative patients were so treated, the exceptional patient having had a left cervical sympathectomy.

TABLE XIV
Patient C T.

a *Nonselective tolerance for the sensitivities to the entire "minor" group of allergens and to one of the "medium" group under daily injections of histamine diphosphate. The items in bold type could be eaten without allergic reaction.*

Group 1 (Major)	Group 2 (Medium)	Group 3 (Minor)
beef	**TOMATO**	**SUGAR CANE**
wheat	rice	**POTATO**
orange	rye	**BANANA**
grapefruit	corn	**STRAWBERRY**
lemon	oat	**ALUMINUM**
plum	coffee	
	onion	

b *Selective abolishment of food sensitivities with sympathectomy The items in bold type have been eaten without allergic reaction ever since the operation.*

Group 1 (Major)	Group 2 (Medium)	Group 3 (Minor)
BEEF	tomato	**SUGAR CANE**
WHEAT	**RICE**	potato
orange	**RYE**	**BANANA**
grapefruit	**CORN**	**STRAWBERRY**
lemon	**OAT**	**ALUMINUM**
PLUM	coffee	Tobacco
	ONION	Chlorinated water

Note The sensitivity to tomato and potato, which had been suppressed by histamine injections, remained unaffected by sympathectomy.

Several months elapsed after the operations on myself and on my several patients who followed me before I realized the improbable and still inexplicable fact that sympathectomy abolishes not all-or-none of the sensitivities, but selectively and unpredictably the sensitivity to *certain* of the allergenic foods.

Table XIIIb presents again the list of my food allergens but here the items in heavy type are those which, since the operation, have been eaten in unlimited quantity without any allergic reac-

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sweet potato	chocolate	carrot	
apple	orange	beet	
	pea-bean	grapefruit	
	peanut	egg	

b. Selective abolishment of food-sensitivities through sympathectomy. The items in bold *type have been eaten without allergic reaction since the operation*

wheat	rice	potato	milk
PORK	oat	peach-plum	**FOWL**
lemon	**TOMATO**	**FISH**	**BANANA**
CORN	lettuce	**ONION**	
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astonishing conclusion seems so important practically as well as theoretically, that I should like to support it with other illustrations.

Table XIVa shows the unselective tolerance toward the weaker

TABLE XVI

Pulse-diet record on four illustrative days after sympathectomy (Case 3)

Time	Pulse	Diet
April 5, 1943		
B R	56	
B	65—	Pineapple
30 m	69	Milk
60 m	64	
90 m	65	
L	62—	Egg
30 m	69	Cheese
60 m	64	Tomato
90 m	66	Milk
		Prunes
D	64—	Chicken
30 m	70	Cabbage (lemon)
60 m	67	Carrots
90 m	67	Milk
Eve	65—	Orange
30 m	66	Raisins
60 m	67	Cheese
		Tea
April 6, 1943		
B R	60	
B	70—	Tomato
30 m	64	
60 m	65	
90 m	66	
L	61—	Egg
30 m	69	Tomato
60 m	71	Cheese
90 m	67	Milk
(shopping)		Pineapple
		Prune
D	63—	Hamburger
30 m	68	Cabbage
60 m	65	Peas
90 m	67	Lemon
		Carrots
		Milk
Eve	64—	Grapefruit
30 m	74	Cane sugar
60 m	78	
90 m	73	
Ret	66	

Time	Pulse	Diet
April 7, 1943		
B R.	67*	
B	79*—	Tomato
30 m	69	Milk
60 m	69	
90 m	68	
L	63—	Lettuce
30 m	69	Tomato
60 m	64	Cheese
90 m	65	Egg
		Milk
		Pineapple
D	64—	Lamb
30 m	75*	Peas
60 m	63	Carrots
90 m	69	Milk
		Apple
		Honey
Ret	67	
April 8, 1943		
B R	60	
B	64—	Pineapple
30 m	66	Milk
60 m	68	
90 m	65	
L	63—	Peas
30 m	65	Tomato
60 m	66	Apple
90 m	61	Milk
D	64—	Lamb
30 m	68	Tomato
60 m	71	String beans
90 m	69	Apple
		Honey
		Milk

Working in Red Cross

* Recurrent reaction from cane-sugar eaten on the previous day.

allergens in patient C. T. induced by daily repeated injections of histamine diphosphate.

This young woman was employed by the Metropolitan Life Insurance Company where a diagnosis of "nervous and emotional

tion. It is seen that whereas the sensitivity to some of the major allergens has been abolished, to some of the weaker ones and even to one of the weakest—milk—it persists. Evidently then,

TABLE XV

Pulse-rate record on four illustrative days previous to sympathectomy (Case 3)

Time	Pulse	Diet, Symptoms	Time	Pulse	Diet; Symptoms
July 25, 1942			July 27, 1942		
B.R.	79		B R	72	
B	93—	Tomato		—	Toothpaste
30 m	96	2 eggs	B	102—	Grapefruit
60 m	102	Pumpernickel	30 m	90	
90 m	100	Milk	60 m	93	
			90 m	100	
L	90—	Pumpernickel			
30 m	93	Ham	Mid A.M.	81—	Milk
60 m	96	Milk	30 m	81	
90 m	96	Tomato	60 m	94	
		Peach	90 m	88	
D	99—	Lima beans	L	99—	Beef
30 m	98	Lamb	30 m	94	
60 m	97	Tomato	60 m	99	
90 m	97	Peach	90 m	93	
		Milk			
		"shaky today"	Mid P M	99—	Pineapple
			30 m	94	
			60 m	99	"shaky"
			90 m	102	
			D	97—	Potato
			30 m	99	
			60 m	97	"very jumpy"
			90 m	96	
			Ret	88	
July 26, 1942			July 28, 1942		
B R.	77		B R.	62—	"very jumpy"
B	100—	Cornflakes	B	95—	Grapefruit
30 m	102	Sugar (cane)	30 m	82	
60 m	93		60 m	90	
90 m	86		90 m	100—	Major seizure, unconscious 5 minutes
Mid A.M.	88—	Milk			
30 m	87	"shaky	Mid A M.	102—	Milk
60 m	89	all morning"	30 m	102	
90 m	93		60 m	114	
L	90—	Cornflakes	L	77—	Chicken
30 m	95	Sugar	30 m	77	Peas
60 m	97		60 m	90	String beans
90 m	98		90 m	94	Pineapple
D	82		Mid P M.	103—	
30 m	85		30 m	110	
60 m	88		60 m	103	
90 m	88		90 m	112	

B R. = before rising
B = just before breakfast
L = just before lunch
D = just before dinner
30 m = 30 minutes after eating

the sympathectomy did not result in a nonspecifically increased tolerance to the H-substance such as can be induced by injections of histamine; the selectivity of the effect of the sympathectomy recalls rather the *specificity* of the sensitivities concerned. This

astonishing conclusion seems so important practically as well as theoretically, that I should like to support it with other illustrations.

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		Prunes
D	64—	Chicken
30 m	70	Cabbage (lemon)
60 m	67	Carrots
90 m	67	Milk
Eve	85—	Orange
30 m	66	Raisins
60 m	67	Cheese
		Tea
April 6, 1943		
B R	60	
B	70—	Tomato
30 m	84	
60 m	65	
90 m	66	
L	61—	Egg
30 m	69	Tomato
60 m	71	Cheese
90 m	87	Milk
(shopping)		Pineapple
		Prune
D	63—	Hamburger
30 m	66	Cabbage
60 m	65	Peas
90 m	67	Lemon
		Carrots
		Milk
Eve	64—	Grapefruit
30 m	74	Cane sugar
60 m	76	
90 m	73	
Ret	66	
April 7, 1943		
B R.	67*	
B	79*—	Tomato
30 m	63	Milk
60 m	69	
90 m	68	
L	65—	Lettuce
30 m	69	Tomato
60 m	64	Cheese
90 m	65	Egg
		Milk
		Pineapple
D	64—	Lamb
30 m	75*	Peas
60 m	68	Carrots
90 m	69	Milk
		Apple
		Honey
Ret	67	
April 8, 1943		
B R	60	
B	64—	Pineapple
30 m	66	Milk
60 m	68	
90 m	65	
L	63—	Peas
30 m	65	Tomato
60 m	66	Apple
90 m	61	Milk
D	64—	Lamb
30 m	69	Tomato
60 m	71	String beans
90 m	69	Apple
		Honey
		Milk
		Working in Red Cross

* Recurrent reaction from cane-sugar eaten on the previous day

allergens in patient C. T. induced by daily repeated injections of histamine diphosphate.

This young woman was employed by the Metropolitan Life Insurance Company where a diagnosis of "nervous and emotional

instability—incurable" had been made. Her chief symptoms were severe dizziness, depression, hysteria, abnormal tiredness, "fluttery heart" (probably extra systoles), neuralgia and constipation. The foods listed in the first column are those first identified as allergens in this case. In the seven months following the elimination of those foods from the diet, the patient was free from her allergic symptoms.

Her symptoms then began to recur and again disappeared on avoidance of the foods listed in the second column (group 2). A few weeks later, her sensitivity to the weaker allergens began to emerge beginning with cane-sugar and she gradually lost weight.

Within a week after the injections of histamine were begun, she found herself able to eat the foods marked by heavy type without reaction and she regained her lost weight at the rate of $2^1/_2$ pounds weekly. Tests of some of the other foods were followed by recurrence of her characteristic allergic symptoms including dizziness.

This experience together with the corresponding one in my own case teaches that the nonspecific antiallergic tolerance obtained by injections of histamine is quantitatively limited to protection against the weaker (minor) food allergens.

Table XIVb presents again the list of the original food-allergens of C. T. The items in heavy type are those that have been eaten since the sympathectomy without any allergic reaction. In this case also the antiallergic effect of the operation is seen to be selective. Although sensitivity to three of the major allergens was abolished, that to the much weaker allergen potato remained. Moreover the sensitivity to three still weaker food-allergens that had not been previously detected now emerged; namely, chicken, egg and tea. To these was added some chemical allergen of the local water supply.

The third case is different from the two just described inasmuch as the pulse-dietary analysis conducted previous to the sympathectomy failed to disclose a single nonallergenic food.

Table XV shows the record for one day on the patient's usual three-meal diet and for three days on a trial diet of selected usually single foods. The patient's chief complaint was idiopathic epi-

lepsy (diagnosis confirmed at Rockland State Hospital, New York). Other symptoms, which disappeared after treatment, were abnormal tiredness, constipation and canker-sores. The operation was performed by Dr. Miscall, August 3, 1942. It is important to note that in the succeeding eight months, that is, in the period before the second pulse-dietary diagnosis was carried out, the number of seizures was "about the same as before the sympathectomy." As a therapeutic measure, then, the sympathectomy was a complete failure, as it has been in so many other reported instances. Now, let us examine its efficiency as an antiallergic measure.

Table XVI shows her record made at the end of the eight-month period. Noteworthy are the generally lower level of the pulse on a large variety of foods; the characteristic constancy of the normal daily maximal pulse rate 70 to 71; the reaction to cane-sugar with carryover, and the internal evidence of the practical dependability of the patient's pulse-counts. So we see that the seizures continuing throughout the eight months following the operation were due to the daily eating of three of her residual allergens, cereals, potato and cane-sugar. Her other residual allergens are fish, dill pickle and cascara, each of which has caused a *grand mal* seizure.

In the succeeding seven years, this young woman after the usual secretarial course of instruction, has occupied a responsible position in a well-known business establishment. She has occasionally indulged liberally in forbidden sweets on a Friday evening, has regularly experienced the expected seizure on the following morning at home, has cleared her alimentary canal with laxatives during the day and has quite recovered in time for her Monday morning appointment.

Sympathetic ganglionectomy has been performed as an antiallergic measure upon 35 patients among a total of 150 food-allergic persons who have had the pulse-dietary diagnostic survey. In a few of the other patients sympathectomy would probably have been advantageous but these preferred the rather sharp restriction of their diet to even the greatly simplified operation practised at the Englewood, New Jersey, hospital by Dr. John H. Irwin. One of these is sensitive to fifteen foods including cane-sugar. Another is sensitive to all meats, egg and potato, many of

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which could undoubtedly be eaten after sympathectomy. Nevertheless, he choses to depend for protein upon milk, cheese, legumes, and nuts; and in fact he maintains excellent health on that restricted diet, actually gaining 25 lbs, up to his normal weight.

It seems probable, then, that between 20 and 25 per cent of food-allergic persons would be greatly benefited, or at least much better able to adjust themselves to their food-allergy, through conservative sympathectomy.

TABLE XVII

Patient E. C. Pulse-diet record the antiallergic effect of stellate ganglion block

Date, 1946	September 27	September 28	October 4	October 5
	Pulse	Pulse	Pulse	Pulse
Before Rising—	67	66	—	69
Before Breakfast	92	81	80	81
30′	92	91	—	81
60′	93	82	—	80
90′	88	83	—	77
Diet—	oatmeal	eggs	81	eggs, toast, *butter, coffee*
Mid-morning—	89	—	1.30 ganglion-block	77
30′	92	—	—	77
60′	89	—	—	75
90′	91	—	—	74
Diet—	milk			tomato
Lunch—	85	85	83—2 30	74
30′	86	87	75	77
60′	81	80	70	80
90′	80	87	75	79
Diet—	eggs (3)	rice	1 quart of milk—2 30	bread, milk, beef, carrot, peas
Mid-afternoon—	80	87	76	79
30′	84	86	77	79
60′	81	85	76	—
90′	—	83	78	76
Diet—	grapes	milk	chicken—6 30	orange
Dinner—	82	80	77	73
30′	81	87	81	76
60′	81	90	81	73
90′	78	90	—	73
Diet—	chicken	chicken, rice, bread, butter	bread, butter, milk, cane sugar—9 00	lamb, peas, corn bread, spinach, coffee

THE STELLATE GANGLION BLOCK

This simple procedure has often been used for the purpose of determining in advance of sympathectomy what "therapeutic" effect could be expected from that operation in the particular case. Thus Miscall and Rovenstine, among a series of 72 subjects of intractable asthma, selected for sympathectomy only the 21 who were temporarily relieved of their asthmatic symptoms by the block. They did not consider this effect of the block and the permanent similar effect of the operation to be antiallergic.

TABLE XVIII

Pulse-dietary record of Mrs. M. (Dr. Max M. Scharf)
(Status asthmaticus, recurrent) before and during the block (pulse-counts usually every hour always taken by nurse or other attendant)

Before the Block

P M Sept. 5	P M Sept 6	A M. Sept. 6	A.M Sept 7
6—97	12—112	1—104	8 15—80
7—94	1—86	2—96	tea, egg fruit
8—120	2—94	3—104	
9—100	3—110	4—104	8 45—112
10—106	4—108	5—100	9 15—100
11—100	5—110*	6—96	9 45—94
	6—96	7—112	12.15—108
		8—103	turkey, peas, fruit juice
		9—104	
		10—96	1 00—96
		11—104	1 30—88
			2·00—92

(Printed vertically: "goat's milk every half hour since noon, Sept 5"; "goat's milk")

During the Block (Injection 7:20 Sept 8—Dr. Wallace Shaw) (Breathing Immediately Improved)

Sept. 8†	Sept. 9
105	92—
92	96
84	88
102 med	84
88 (wh.)	88 med.
80 egg	102
96	96
100 (wh. ++)	80
88	82
72	84
84	92
88 cough	88
78	112
84	90
88	88
96	84 oxy. disc.
82	82
84 {coffee med	80 lettuce
112 frontal pain	100 (T. 100 4 rectal)
105 nauses	102
105 (wh. hal)	120
108 (oxy. incr.)	116
	88
	102
	96

* Chicken, bread, str bean, tomato, tea, jam (no milk).
† Benadryl or demerol 1.00 and 5 00 A M. med = KI, pyribenzamine, benadryl. wh = wheezing, hal = hallucinations. oxy. incr. = oxygen increased. T. = temperature

I have found the block to be highly valuable as an antiallergic, diagnostic measure and sometimes as a therapeutic procedure in preparation for sympathectomy. These uses are illustrated in the accompanying Tables.

Table XVII shows the pulse-dietary record of the first case in whom the block was used diagnostically.

which could undoubtedly be eaten after sympathectomy. Nevertheless, he choses to depend for protein upon milk, cheese, legumes, and nuts; and in fact he maintains excellent health on that restricted diet, actually gaining 25 lbs, up to his normal weight.

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Before Breakfast	92	81	80	81
30′	92	91	—	81
60′	92	82	—	80
90′	88	83	—	77
Diet—	oatmeal	eggs	84	eggs, toast, butter, coffee
Mid-morning—	89	—	1 30 ganglion-block	77
30′	92	—	—	77
60′	89	—	—	73
90′	91	—	—	74
Diet—	milk			tomato
Lunch—	85	85	83—2 30	74
30′	86	87	75	77
60′	81	86	70	80
90′	80	87	75	79
Diet—	eggs (3)	rice	1 quart of milk—2 30	bread, milk, beef, carrot, peas
Mid-afternoon—	80	87	76	79
30′	84	86	77	79
60′	81	85	76	—
90′	—	81	78	76
Diet—	grapes	milk	chicken—6 30	orange
Dinner—	82	80	77	73
30′	81	87	81	76
60′	81	90	81	73
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THE STELLATE GANGLION BLOCK

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easily tolerated the conservative sympathectomy and could leave the hospital on the fifth day thereafter. Noteworthy in this case is the suspected sensitivity to the medication; also the fact that the pulse-rate tended to be much higher when the procaine-block was repeated, once as high as 132, although the suspected food-allergens were avoided and there was no asthma. One may hazard the suggestion that repeated injections into the same area may cause sufficient tissue damage to elevate the pulse-rate—an effect which regularly follows operation.

It is to be noted, furthermore, that in this case the repeated block was used for the first time, so far as we are aware, as a continuing therapeutic measure to prepare an allergic patient for anti-allergic sympathectomy

Finally, the status asthmaticus in this patient is seen to have been caused by nonreaginic, idioblaptic sensitivity to foods. It is unlikely that inhalant excitants were involved in the etiology since sympathectomy has not yet been observed to extinguish sensitivity to any inhalant allergen. In other words, if the status had been due to inhalant allergens the condition would not have ceased after block and operation.

The record of S. N. (Table XXXI) is instructive in the sudden considerable drop (32 beats per minute) immediately following the injection of novocain and the equally abrupt rise (34 beats) as the block broke 46½ hours later

It has been seen, in the case of Mrs. M., that repetition of the injection of novocain, together with avoidance of pulse-accelerating allergens, may be used effectively in extending the period of freedom from symptoms in weakened persons, thus giving the patient time to recover strength preparatory to the sympathectomy. In a few instances a repetition of the block has been useful also in extending the test-period, enabling the examiner to repeat some of the food-tests and to make additional ones. This is especially desirable if the first block is spoiled by the unlucky selection of several residual allergens for the first tests following the injection of novocain. However, in many cases the pulse-counts are regularly higher after the second or third injection of novocain, and this prevents further testing.

The record of J. Z. (age 19), suffering for two months with continual outbreaks of intensely itching urticaria (see Table XIX), is

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The record of J. Z. (age 19), suffering for two months with continual outbreaks of intensely itching urticaria (see Table XIX), is

TABLE XIX

Pulse-dietary record of J. Z. (chronic urticaria) before and during the block (pulse-counts usually every half hour)

Two Days Before the Block*		Two Days During the Block†† Oct. 13	Oct. 14
80 hives	78† hives		82**
88	90		78 orange, coffee
74	98		78 toast
80	98		78 *str. beans*
72	90	92 before injection	80
78	94	80 after injection	80 Swiss cheese
78	96	— lettuce	70 peas
80	88	78	74
90	92	78 *cabbage*	74 *potato, crisco*
80	98	80	70
76	90	78 beet, choc.	70 fish
88 itching	90	80 hives	70
96 hives	74	80 CORN	74 pork, B.B., milk
92	—	80	76
92	—	88 hives	80
98	84 feet itch	84	74 *ONION, cracker*
100	94 crop of hives	84 grapefruit, beef, potato, milk, B.B.	72
100 fresh crop of hives	—	90	80
94	80	90 marked hives	88 hives
88	—	— choc.	86
88	70	84	86
88	—	82	84
70	—	84	92 *grapefruit*, beef, bread, milk
80	72	80	92
68		78	100 "marked hives everywhere"
74 heel swollen		68 plastic cover on bedding	—
68			76

* Diet: orange, bread, coffee, milk, pork, banana, prune, peach, apple, lamb, chocolate, sugar. *None of these foods accelerated the pulse in the block or after the sympathectomy.*
† Pulse higher than on retiring suggests sensitivity to bedding-dust.
†† Residual food-allergens = corn, onion. B B = bread and butter.
** Pulse higher than on retiring indicates sensitivity to plastic, which was removed, mattress and pillow Dust-Sealed. In a second block found still sensitive to strawberry but not to beef.

instructive in several respects: (1) the prompt drop of the pulse-rates after the injection of novocaine into the stellate ganglion; (2) the identification of corn, onion and the plastic as pulse-accelerating allergens; and (3) the secondary rise of the pulse following ingestion of corn and onion, immediately after a liberal meal including beef, to which the patient was not sensitive in the block. This phenomenon has frequently been observed and has been thought to be due to an increased absorption of remnants of undigested allergen that may be assumed to occur when peristalsis is stimulated by the succeeding meal.

John H. Irwin* has reported his experiences, with his simplified technic, in 25 cases of severe, idioblaptic symptoms. He writes:

"The operation has been so simplified that patients can be discharged from the hospital as early as the fifth day.

"Early childhood has been found to be the most favorable age for the operation."

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* *Med Record*, *163* 297, 1950.

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100 fresh crop of hives	—	90	80
94	80	90 marked hives	88 hives
88	—	— choc	86
88	70	84	86
88	—	82	84
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80	72	80	92
68		78	100 "marked hives everywhere"
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upon intravenous injection of the determined lethal dose of dog's serum.

It is instructive to reflect that the lymphatic obstruction took place so quickly after the injection and was so effective and prolonged that two days thereafter not even enough of the serum had been absorbed to desensitize the animals in a perceptible degree.

The local, human, allergic obstruction in the efferent lymphatic channels can be released with dramatic suddenness either spontaneously or through the action of epinephrine. If considerable areas of skin and subcutaneous tissues are involved the rapid disappearance of the impounded fluid from the lesions is accompanied with a more or less marked polyuria, and a corresponding loss of body-weight

Among the more familiar examples of pressure resulting from the local impounding of allergic edematous fluid are chronic rhinitis, hemorrhoid[2] and migraine. In the first of these the pressure affecting the edematous swelling is evidenced by the tension of the covering membrane. In migraine the intracranial pressure of the meningeal edema has been directly observed.[3] A portion of skull had been removed with trephine over the frontal area of severest pain. Between the attacks of migraine, since the operation, the resulting scar is depressed; during the attack it bulges outward.

Although the allergic edema itself *may* reasonably be assumed to be always reversible through the use of antiallergic measures, the damaging effects of the pressure developing in the lesion may become irreversible if the pressure is protracted and the tissue involved in it is unusually vulnerable. This latter circumstance is possibly illustrated in an instance of allergic edema affecting the macula of the left eye. The lesion, which was observed and outlined by Dr. Bernard *Samuels*, occurred seasonally (summer) in the first two years, the vision being quite normal in the interval. Thereafter it was perennial. In spite of the subsequent control of the individual's food-allergy through identification and rigorous avoidance of all offenders there has not been any remission of the lesion.

After the criterion of pulse-acceleration had proved its value in the specific diagnosis and prevention of numerous ailments of pre-

CHAPTER XI

Essential Hypertension

(Theory and Practice in Its Control Through Antiallergic Measures)

PART I

PRESSURE

Its Part in the Production of Functional Disturbances of Allergic Disease

THE EXAMPLE OF allergic pressure most conveniently situated for the purpose of observation and analysis, is no doubt the common wheal. The area of pressure in this lesion is obviously the central, elevated, ischemic zone. It is evident that this tense swelling represents fluid restrained by some obstruction to its normal outflow through the lymphatic channels, and subjected to the *vis-a-tergo* exerted by the arterio-capillary blood-pressure. This allergic obstruction of the efferent lymphatics has its well-known counterpart in the wheal produced by intracutaneous injection of a solution of histamine or other irritants.

A similar obstruction has been observed by the writer[1] as occurring at the subcutaneous site of the injection of *fresh* dog's serum in guinea pigs. The injection of 1 to 2 cc of the serum caused a large tense swelling, and with the use of an anti-dog precipitating serum in quantitative test tube tests of the fluid expressed from the swollen tissue it could be estimated that the entire quantity of the injected dog's serum had remained in the area. When these relatively large quantities of the fresh dog's serum were injected subcutaneously into guinea pigs that had been sensitized with dog's serum the animals were not desensitized and succumbed in typical anaphylactic shock on the following day

upon intravenous injection of the determined lethal dose of dog's serum.

It is instructive to reflect that the lymphatic obstruction took place so quickly after the injection and was so effective and prolonged that two days thereafter not even enough of the serum had been absorbed to desensitize the animals in a perceptible degree.

The local, human, allergic obstruction in the efferent lymphatic channels can be released with dramatic suddenness either spontaneously or through the action of epinephrine. If considerable areas of skin and subcutaneous tissues are involved the rapid disappearance of the impounded fluid from the lesions is accompanied with a more or less marked polyuria, and a corresponding loss of body-weight.

Among the more familiar examples of pressure resulting from the local impounding of allergic edematous fluid are chronic rhinitis, hemorrhoid[2] and migraine. In the first of these the pressure affecting the edematous swelling is evidenced by the tension of the covering membrane. In migraine the intracranial pressure of the meningeal edema has been directly observed.[3] A portion of skull had been removed with trephine over the frontal area of severest pain. Between the attacks of migraine, since the operation, the resulting scar is depressed; during the attack it bulges outward.

Although the allergic edema itself may reasonably be assumed to be always reversible through the use of antiallergic measures, the damaging effects of the pressure developing in the lesion may become irreversible if the pressure is protracted and the tissue involved in it is unusually vulnerable. This latter circumstance is possibly illustrated in an instance of allergic edema affecting the macula of the left eye. The lesion, which was observed and outlined by Dr. Bernard Samuels, occurred seasonally (summer) in the first two years, the vision being quite normal in the interval. Thereafter it was perennial. In spite of the subsequent control of the individual's food-allergy through identification and rigorous avoidance of all offenders there has not been any remission of the lesion.

After the criterion of pulse-acceleration had proved its value in the specific diagnosis and prevention of numerous ailments of pre-

viously uncertain etiology, the problem of the pathogenesis of those now recognizably allergic conditions called for consideration.

The first important one of these was circulatory hypertension.[4] The speculation in this instance was influenced, indeed suggested, by the results of the previous experiments of Goldblatt. Those experiments revealed renal ischemia as a possible secondary factor in the complicated etiology of hypertension.

The factor of renal ischemia must be *secondary*, itself a consequence of some primary influence which must be assumed to affect both kidneys, to be reversible and in most cases intermittent. As soon as the hypertension had been shown by actual clinical observation with the use of the pulse-dietary method to be probably a consequence of food-allergy, allergic edema of the kidneys under pressure suggested itself as a plausible primary influence possessing the qualities postulated above for the hypothetical original cause. Indeed, those same qualities are observable in allergic symptoms affecting other parts of the body.

Glaucoma,[5] for example, affects both eyes though not always. That condition is reversible and may be intermittent. These two *last named qualities are familiar in the common allergic symptoms* of migraine, indigestion, bronchial asthma, epilepsy and others.

Nothing in the manifestations of hypertension is incompatible with the idioblaptic theory of its etiology, which is solidly confirmed by the regular success in the control of the condition through the use of the available antiallergic measures.

PART II

The Relation of Idioblaptic Allergy to Hypertension

THE CONCEPT OF *idioblaptic allergy developed from the observa*tion and diagnostic use of specific tachycardia as a criterion of allergic reaction.

In 1935 it was observed in a case of angina pectoris, with typical E. K. G. changes, that the anginal attacks followed the eating of foods which caused marked acceleration of the pulse (sometimes up to 180). When all pulse-accelerating foods were avoided the

attacks ceased. Soon thereafter the patient reported that a migraine and a colitis of many years' duration had also disappeared. These conditions were recognized as allergic and the specific acceleration of the pulse was seen as a means of identifying the allergic excitants. Incidentally, the blood-pressure in this patient was normal.

The procedure just referred to has been successfully applied by different investigators in a total of over 300 patients suffering from a great variety of illnesses of previously unknown cause. Each condition has been identified as idioblaptic in the following features:

1. The idioblaptic pulse-character* is present in all subjects.
2. The condition has disappeared in all cases following stabilization of the pulse, through avoidance of all pulse-accelerating foods, inhalants, etc.
3. It has recurred upon re-exposure to one or more of the pulse-accelerating materials.
4. It has again disappeared following restabilization of the pulse through avoidance.

Among the common idioblaptic symptoms so identified are migraine, constipation, neuralgia, hemorrhoid and *overweight;* more serious are peptic ulcer and epilepsy. Four statistically satisfactory surveys have indicated that upward of 90 per cent of the white population are affected with this category of allergy; its familial nature is well established. The *skin-tests* with identified excitants of idioblaptic allergy are regularly negative.

The relation of idioblaptic allergy to circulatory hypertension was first discussed in the first edition of my monograph, in which the thesis was argued on a three-fold theoretical basis.

1. *Goldblatt's* principal conclusions regarding the mechanism of the production of hypertension were accepted as satisfactorily demonstrated; *namely:*
   a) "That ischaemia *limited to the kidneys* may be the initial condition in the pathogenesis *of* the hypertension that is associated with nephrosclerosis. If this be *true,* then

* The idioblaptic pulse-character consists in a range of more than 16 beats (usually much more) from the lowest to the highest rate per *minute,* in usual activity, and a variation greater than two beats per minute in the *daily* maximum.

renal ischaemia, no matter how produced, should be followed by elevation of blood-pressure.

b) "Hypertension without or with disturbance of renal function, resembling in this respect the benign and malignant types, respectively, in man, can be produced by varying the *degree* of constriction of the renal arteries."

2. The kidney was assumed to be an independent allergic shock organ.

TABLE XX

Twelve cases of hypertension, showing reduction of the blood pressure after stabilization of the pulse with dietary control

			Blood Pressure				Pulse Maximum		
			Previous to Treatment		At Termination of Treatment		Before Treatment	After Treatment	
Case	Sex	Age	S	D	S	D			Residual Allergens
1	F	63	198	120	118–124	70–72	98	72	None
2	M	32	160	110	122–142	84–88	92	76–80	Tobacco. Other inhalants
3	M	50	160	100	128	88	100	76	Occupational inhalants
4	M	38	150	90	110	70	94	78	None
5	M	40	134	90	106–126	72–74	116	66	None
6	M	67	190–202	106–122	134 5	74	100	68–70	Inhalants
					avg one month				
7	M	55	145	98	126	74	78	68	None
8	M	54	180	108	128	78	92	74	None
9	M	57	220	116	158	87	88	84	Occupational inhalants
					avg one month				
10	M	68	174–178	92–98	158–162	80–86	92	70	Inhalants
11	F	43	150	90	122	84	110	84	None
12	M	62	146	90	130	76	68	62	None

3. A hitherto unexplored physical factor in the causation of disease was assumed to be brought into play through the allergic reaction within the kidney. This factor is merely the increased subcapsular pressure caused by the allergic edema. It is easily conceivable that pressure developed in that way could retard the renal circulation sufficiently to provide the essential condition of the Goldblatt experiment.

That condition is known to be provided when pressure is applied to the organ externally.

It is also conceivable that this physical factor of allergic subcapsular pressure may play a similar role in the etiology of diseases known to be due to a disturbance of the internal secretion of other organs.

It was pointed out that "if the renal vessels have been permanently narrowed by a chronic inflammatory process following infections (glomerulonephritis), or by the secondary sclerosis of malignant hypertension, this irreversible cause of hypertension would persist after the elimination of any existing food-allergy."

Of the nine cases on whom the report was based two were of no positive value in evidence because it was not possible to identify all of the food-allergens affecting them. A summary of the pertinent data in the other seven cases is presented in Table XX, in which have been included five other similar cases.

There has been no development in any of these cases in the succeeding years that contradicts the evidence indicating the allergic cause of their hypertension. However, four of them have been withdrawn from observation; three into the armed forces and one into an occupation in which he is accessible only by telephone. The latter patient reports merely that he remains free from all of his allergic symptoms.

Case 1. (Mrs E. A) This patient's diet was so limited that in July, 1942, she underwent a sympathectomy the consequences of which are described in the chapter on that operation (2nd Ed, p. 102). At the time when that chapter was written for the publication in the *Annals of Allergy* the record showed a range of the blood-pressure since the operation of 128/64 to 140/86. Since that time the patient has observed her dietary restrictions more carefully, though not absolutely, and the usual range has been 120/74 to 140/78. The patient (70 years) conducts a highly successful candy-manufacturing business

Case 7. (M. G. H.) This patient has neglected some of his dietary restrictions in recent months, his allergic symptoms have recurred and he again presents a moderate hypertension (136/90).

Two other reports concerning idioblaptic allergy pay particular attention to the role of food-allergy in hypertension. These are the papers of Sumner Price[6] and of Milo G. Meyer.[7]

Among the "about 50 cases of nonreaginic food-allergy" treated by Price six were hypertensive. The results of the pulse-con-

trolled, dietary treatment in three of these six cases were not satisfactory although even in these the record adds, as Price writes, *definite and positive experimental evidence of a relationship between allergy and hypertension.* A summary of essential data in the six cases is shown in Table XXI.

TABLE XXI

Six cases of hypertension treated by S. Price with the method of pulse-controlled trial-diet

Case	Sex	Age	Blood Pressure: Previous to Treatment S	D	At Termination of Treatment S	D	Identified Allergens	Causes of Failure
1	M	38	220	164	164	132	Tomato, potato, tobacco, egg, pea-bean, cereals, beef, milk, sweet potato, celery, fowl, fig, berries, red pepper	Patient refused to continue the drastic dietary restrictions
2	F	48	320	218	196	146	Lamb, beef, fish, fowl, potato, tomato, asparagus, carrot, corn, avocado, celery, cottonseed	Patient died of stroke before completion of treatment
3	F	58	210	120	156	102	Lamb, banana, wheat, carrot, corn, bean, beet, lettuce, asparagus, strawberry, egg, cottonseed, grape	Treatment not completed
						Three cases with satisfactory result		
4	F	51	200	94	126	68	Lamb, fowl, pork, cereals, egg, citrus fruit, plum fam , fig, cabbage fam , bean, apple, grape, chocolate, melon, berries, carrot, sweet potato, cheese	
5	M	27	150	96	120 122 128	80 (4-29) 78 (6-18) 78 (9-10)	Apple, citrus fruit, banana, fig, plum fam , grape, sweet potato, date, nuts, bean, pear, etc	
6	M	42	168	86	134 126 128	78 (7-17) 78 (7-21) 78 (8-5)	Lamb, egg, bean, chocolate, fig, cucumber, potato, grape, onion, pineapple, tobacco, peppermint, walnut, cheese, ginger, cottonseed	

S = systolic. D = diastolic.

My own experiences support the following conclusions reached by Price:

"Hypertension may be due to the allergic effect of minor allergens Total protein-content of an allergen is not as important as the specificity of the protein. "Animal proteins are not the most common offending agents. Each diet must be individualized."

Price comments, "There is little to be gained clinically in experimentation in the terminal phases of nephro-sclerosis." In general one must agree with this opinion because nephrosclerosis involving the blood vessels presents an irreversible, productive lesion However, one should consider the theoretical possibility that in some sclerotic cases the added food-allergic edema may choke the residual circulation and thus turn the scale against the patient.

Among 116 patients reported by Milo G. Meyer[7] in whom a successful result was obtained with the pulse-dietary method he lists 24 of hypertension.

TABLE XXII*

Showing the favorable effect on hypertension of avoidance of pulse-accelerating foods

Name	Age	Previous Blood Pressure (6 or More Readings, Avg)		Present Blood Pressure (10 or More Readings, Avg)		Allergens	No of Months Followed
		S	D	S	D		
Mrs. P M	52	190	110	140	86	Beef, peas, str. beans, tomatoes, spinach	22
Mrs S R	64	220	130	160	90	Eggs, celery, citrus fruit, apples	21
Mrs M M	58	190	110	150	84	Potatoes, beef, peas, str beans	21
E P	40	166	100	142	84	Citrus fruit, cane sugar, fish	21
Mrs J F	47	180	120	146	80	Eggs, pork, coffee, choc, chicken	21
J D	38	158	100	130	76	Chocolate	21

* Reprinted here by permission of Dr M G Meyer from *Ann Allergy*, 6: 417–427, 1948

Meyer writes:

"Table I* shows six typical examples of patients who have been followed longer than eighteen months and who continue to be well controlled, and in whom, as in the other eighteen, no complications involving progressive renal or cardiac damage have been noted

"Although it is generally agreed that when renal damage exists to a degree recognizable by laboratory procedures, little can be offered, I should like to mention two patients who have had both clinical and laboratory improvement following elimination therapy. This is shown in Table II."†

* Reprinted here as Table XXII.

† Reprinted here as Table XXIII.

THE "RICE-DIET"

In 1944 (*Science News Letter*, July 15), Dr. Walter Kempner of Duke University reported a "reduction" of blood pressure in about 60 per cent of his patients, when their diet was limited to rice, fruit juices, sugar, vitamins and iron.

In the second edition of this monograph it is suggested that the "rice-diet" represents merely an uncontrolled hit-or-miss avoidance of the most common food-allergens. It was pointed out that

TABLE XXIII*

Showing the lowering of blood pressure and improvement of renal function and symptomatology, after avoidance of pulse-accelerating foods

	Before Allergens Out			After Allergens Out		
Name	B.P	Urine	Chemistry	B.P.	Urine	Chemistry
Mrs. E. L. Age 36 Dizziness Headache Exertional dyspnea Heart conscious	250/140 230/136	Sp. Gr. 1.004 Alb.-Tr. Micro. 3–4 Hyaline 1–2 granular HPF	NPN-48 Urea N.-30 PSP 1 Hr.-20% 2 Hr.-22%	160/83 158/84 158/82	Sp. Gr. 1.016 Alb.-0 Micro Amorph. urates only Only occasional headache now	NPN-32 Urea N.-18 PSP 1 Hr.-40% 2 Hr.-35%
Mrs. S. R. Age 62 "Palsy" Dizziness Exertional palpitation Angina Dyspnea	210/130 230/134	Sp. Gr. 1.006 Alb.-+ Micro. 7–8 Hyaline 4–5 granular HPF	NPN-52 Urea N.-32 PSP 1 Hr.-28 2 Hr.-18	170/90 172/88 168/88	Sp. Gr. 1.014 Alb.-spt. Micro. 1–2 Hyaline HPF Dyspnea only-T with marked exertion	NPN-40 Urea N.-20 PSP 1 Hr.-40 2 Hr.-20

* Reprinted here by permission of Dr. M. G. Meyer from *Ann. Allergy*, 6: 417–427, 1948.

more than half of observed food-allergic persons are not sensitive to any of the components of the diet and reference was made particularly to Warren Vaughan's statement that "Rice in our experience is the least frequently allergenic of the cereals" (*Practice of Allergy*, p. 319).

The superior results of the *specific* selection of the diet as com-

pared with empirical selection of the "rice-diet" are apparent in the following table:

		Average Systolic	Average Diastolic
Before "treatment"	"Rice-diet"	210	120
	Specifically selected diet	190	115
After "treatment"	"Rice-diet"	138	100
	Specifically selected diet	142	82

The figures of the "rice-diet" group are taken from the report of Contratto and Rogers[8] upon 34 cases, the "after treatment" figures being taken at three months, and the patients being warned that the favorable effect of the diet is "not necessarily permanent." The figures of the group on the specifically selected nonallergenic diet are taken out of the writer's report together with those reported in detail by Milo G. Meyer.

These were the 14 cases whose diastolic pressure before treatment was at least 100. The "after treatment" figures represented averages observed over periods of 21 months or longer. The patients could be advised at the conclusion of the pulse-dietary course that the favorable effect of their continued avoidance of pulse-accelerating allergens would probably be permanent.

Meyer also makes the general statement concerning his 24 cases "successfully" treated that whereas the diastolic pressure prior to elimination therapy had averaged over 100, "the average diastolic pressure of those treated is now 86."

Aside from its general impracticality, the "rice-diet," as an empirical procedure, suffers in its effectiveness from its inattention to the many inhalant and other nondietary excitants especially house-dust and tobacco. Nevertheless, one may well ponder the impression, expressed by *Contratto* and *Rogers*, that even the very inadequate avoidance of food-allergens represented by the rice-diet "offers the greatest hope so far for the medical treatment of a disease in which to date, the therapeutic results have been notoriously poor."

Summary

1. In the 42 subjects of circulatory hypertension who have been reported by three independent observers as "treated" with

avoidance (usually not complete) of pulse-accelerating foods and other materials, the blood pressure has been permanently reduced in most instances to a low average not attainable with any other described procedure.

2. This result identifies hypertension as a consequence of idioblaptic allergy and thus explains the favorable effect of the "rice-diet," which is seen to be an empirical and inadequate elimination diet. It also explains the improvement, which sometimes follows sympathectomy; since that operation has been proved to abolish many nonreaginic food-sensitivities.

3. These observations and conclusions, taken with a now considerable experience with other manifestations of idioblaptic allergy by a number of independent physicians, justify the expectation that a large majority of hypertensive patients can be placed in effective, safe control of their blood pressure.

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CHAPTER XII

Clinical Versus Etiological Diagnosis

ONE OF THE rather complaisant scoffers at the concept of idioblaptic disease in general and in all its details, has dwelt with derision upon the mistakes in clinical diagnosis that have been committed by some allergists. He chided an allergist for his prolonged and unsuccessful antiallergic "treatment" of a patient troubled with scabies. That criticism openly implies a weakness in the art of clinical diagnosis among allergists, and it has suggested this brief inquiry into the uses and the technics of the diagnostic art and the factors which affect its importance in the care of the ailing human being—especially the idioblaptic person.

In the earlier period of modern medical science when the first chapter of the etiology of the infectious diseases had yet to be written, the medical care of the sick consisted for the greater part in differential diagnosis, palliation and placebo.

It was a logical assumption that a constant and characteristic symptom-complex indicated a correspondingly specific cause; and this assumption was brilliantly vindicated in the discovery of the long list of agents of the microbic infections and other parasitic disease beginning with anthrax. The disease anthrax was a recognizable pathological entity when Koch began his classical investigation of its causal microörgansim.

Under the influence of this accepted principle, clinical and pathological diagnosticians have labored to extend the classification of diseases of unknown cause. All available criteria of differentiation have been impressed into these efforts: anatomical localization, histological differences, chief and lesser symptoms, differences in nervous and other psychological responses to various stimuli, differences determined through various special examinations of the blood and other body fluids and with the use of instruments that record the minute electrical discharges resulting from

physiological processes, especially in the central nervous system and in the heart.

These differentiations have tended to divert the attention of investigators to some extent from the not uncommon experience that one and the same cause of disease may affect different parts of the body producing grossly different symptoms. Striking illustrations of this fact are pneumococcal meningitis and pneumonia, gonorrheal urethritis and arthritis, chancre and tabes dorsalis.

Varying localization of specific infections is exceptional rather than the rule, whereas the superlatively protean character of the manifestations of idioblaptic allergy marks the very nature of that constitutional malady. It is no wonder that medical science has not suspected, much less looked for, a common cause of indigestion, epilepsy, eczema, diabetes, glaucoma and multiple sclerosis.

The clinical differentiation of these manifestations is reasonable and will long be used. However, to one experienced in the application of the pulse-dietary diagnostic technic it will seem less important to distinguish the various degrees and symptomatic classifications of recurrent headache and of recurrent vertigo, the different appearance of food-allergic eczema and urticaria; the various forms of psychoneurosis and psychosis and numerous other clinically separable manifestations of idioblapsis affecting the same region of the body. Once the common cause of all these conditions has been established, the search for additional signs of the *effects* of the allergy in those areas will seem at least less important.

It is worth noting that the scientific method frequently overshoots the proper mark of medical research. Much effort, talent and money are being expended in the more and more refined study of the *effects* of disease and the means of their symptomatic alleviation. A natural consequence of such a course is a tendency to place undue value upon the mere improvements in the technics used in those studies.

But the studies of the effects of idioblaptic disease themselves, however minute, could not reveal their *cause*. The combined investigations of clinicians and pathologists have not told us that ulcer and hemorrhoid may be due to idioblaptic sensitivity to

milk, that hypertension is frequently caused by allergic sensitivity to house-dust, that angina pectoris may be precipitated by allergic sensitivity to morphine or novocaine or potato and that epileptic seizure and multiple sclerosis may be caused by allergic sensitivity to tobacco.

The proper aim of *medical* research is the discovery of the primary cause of disease and the means of its avoidance or eradication. *Scientific* research may still find an ample field in the study of the *normal* man, when he is permitted to take his rightful place on the earth.

In quite unruffled response to the critic mentioned at the beginning of this chapter, I offer the following experience of a close family friend, who has been a valued employee in a reputable hospital in New York.

For a long time she had been under the anxious observation and advice of the attending physicians on account of painful episodes localized in the chest and referred by those clinical diagnosticians to a "heart condition." Their treatment consisted of rest and digitalis.

Like the condition cited by the critic this one was not relieved by the "treatment," for an emergency operation showed it to be caused by cholecystitis and cholelithiasis. But in this case the appropriate treatment could very well have been the same whichever organ was affected, namely, the pulse-dietary diagnostic course. The attacks of angina pectoris and the cholecystitis are both probably allergic.

physiological processes, especially in the central nervous system and in the heart.

These differentiations have tended to divert the attention of investigators to some extent from the not uncommon experience that one and the same cause of disease may affect different parts of the body producing grossly different symptoms. Striking illustrations of this fact are pneumococcal meningitis and pneumonia, gonorrheal urethritis and arthritis, chancre and tabes dorsalis.

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45) are unable to remove the bacteria from the blood at a rate sufficient to assure survival.[1-4]

As Locke points out, these methods of study are not applicable to man, but in his study of common cold he has made use of two other methods with which he has obtained results that carry the same significance in principle as those of the rabbit experiments just described.

Locke determined the "oxygenation time" in a group of persons variously susceptible to common cold under conditions of physical stress which were produced by having the individual undertake a vigorous exercise of the muscles of the back, arms, and legs in a specially designed apparatus.[5] The "oxygenation time" represents the rate at which oxygen is used up by the individual when he exerts himself to the utmost in the apparatus; the figure thus obtained is corrected according to the estimated body surface of the person.

In the "optimal response" A the "oxygenation time" was in the neighborhood of 0.60; it was shorter, e.g., 0.40 to 0.44, in the "hyper-response" C[1] and longer, e.g., 0.79 and 0.85, in the "hypo-response" C.

Under this procedure Locke found that among those persons classified as A ("optimal response") 74 per cent reported less than two colds during the year, whereas among the C group only 5 per cent had had less than two colds during the year.

Locke found also that, regardless of the classification determined in the individual previous to the onset of a cold, the grading at the time the attack began was C, and the condition of the person was that of "physical exhaustion and shock which a grading of C connotes." He states: "Common cold has less similarity to infections of the type producing small-pox, typhoid and diph-

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[1] Locke, A. Lack of Fitness as the Predisposing Factor in Infections of the Type Encountered in Pneumonia and in Common Cold, *J. Infect. Dis.*, 60 106, 1937

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CHAPTER XIII

Idioblaptic Allergy as a Predisposing Cause of Low-Grade Infections

1. COMMON COLD*

THAT NONSPECIFIC INFLUENCES *may act as predisposing causes* of common cold has been amply demonstrated in two of a brilliantly conceived series of studies on "Nonspecific Factors in Resistance" that have been carried out by Arthur Locke. These remarkable papers have had such scant attention in medical literature, and the conclusions reached in them are so directly applicable to the observations about to be described, that a summary of the outstanding pertinent results of Locke's findings is included here as follows:

Summary of Locke's Investigations

1. Normal rabbits differ in the speed with which they can accomplish removal from the circulating blood of small numbers of intravenously injected Type I pneumococci. Only those rabbits whose rate of removal of the injected pneumococci is faster than the rate of proliferation of the pneumococci survive the injection.

2. When normal rabbits are immersed in cold water until the body temperature has been reduced from the normal 102° to 103° F. to between 95° and 96° F., they differ according to the time required *for a temperature recovery of 3° F.—"warming time."* Those with fast recovery (warming times of 30 to 33) dispose of injections of small numbers of virulent Type I pneumococci with a rapidity that permits a high percentage of survival. On the contrary, rabbits, with a slow recovery (warming times longer than

* Reprinted from the *Journal of Laboratory and Clinical Medicine*, 26:757, Feb., 1941.

45) are unable to remove the bacteria from the blood at a rate sufficient to assure survival.[1–4]

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In the "optimal response" A the "oxygenation time" was in the neighborhood of 0.60; it was shorter, e.g., 0.40 to 0.44, in the "hyper-response" C[I] and longer, e.g., 0.79 and 0.85, in the "hypo-response" C.

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theria than with infections of the type observed as a result of invasion from the lungs and intestines in dogs and rabbits during transient exhaustion[6] and shock.[7]"

In a more recent study[8] Locke has confirmed his general thesis that "low-grade infection (such as common cold) gains foot-hold because of impairment in the ability of the defense mechanisms to *function.*" In this study he has used a method which spares the individual the physical strain that was involved in the determination of the oxygenation rate. This method requires the person merely to inhale 5 per cent carbon dioxide for one to two minutes. The inhalation of 5 per cent carbon dioxide causes a "measurable, reproducible and characteristic increase in the depth of breathing."

Defining the "ventilation quotient" as the ventilation rate, noted under the influence of carbon dioxide, divided by the basal ventilation rate (B.V.R.), as observed when the person is merely lying at rest, Locke proposed the figure 1.29 as the optimal ventilation quotient of a normally resistant individual. A group of persons showing ventilation quotients within 5 per cent of this optimum showed a much lower incidence of common cold than did the group showing ventilation quotients diverging 10 per cent or more from that optimum. One may again sum up Locke's results with his two methods as follows: there is a state of impaired physiologic function, the nature and cause of which is unknown, that can be detected in the individual through two quantitative methods; this state of impaired physiologic function may be found to affect some individuals at one time but not at another. Those individuals in whom the impaired function is not found are less susceptible to colds than are those in whom it is found, and the impairment is always present at the onset of a cold.

These findings indicate that susceptibility to common cold is

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[6] Bailey, G Howard: Accessory Etiologic Factors of Respiratory Infection in Rabbits. II. The Effect of Fatigue on the Susceptibility of Rabbits to Intranasal Infection with Type I Pneumococcus, *Am. J Hyg*, *9*:102, 1929, Boycott, A. E., and Price-Jones, C.: Experiments on the Influence of Fatigue on Infection, *J. Path & Bact.*, *29*:87, 1926.

[7] Boone, T H, Chase, E M, and Brink, H E: Intestinal Absorption of B. prodigiosus, *Proc. Soc. Exper. Biol & Med*, *29*:113, 1931.

[8] Locke, A.: Nonspecific Factors in Resistance. V. Carbon Dioxide Tolerance, *J. Immunol.*, *39*:441, 1940.

not due to a lack of the mechanism of defense but to a nonspecific impairment of the ability of the mechanism to function.

For a certain purpose, unrelated to the present inquiry, I made in September, 1939, a survey of 825 employees of Lederle Laboratories in Pearl River, N. Y., with respect to the incidence of common cold. These persons were kept under periodic observation in the winter and spring of 1939–1940. Among the 825 individuals 99 reported having had no colds in the past three years. Locke in Pittsburgh finds 12 per cent of unselected persons free of colds. Paul and Freese,* in Spitzbergen reported about 10 per cent and Brown† in the Aleutian Islands about one in eight insusceptible.

Fifty-two of these cold-free persons were selected for further examination because of their ready accessibility and their intelligence. Fifty-one persons who had a history of at least one cold‡ annually were similarly selected for examination.

Each individual of these two groups was repeatedly questioned as to the presence of food-allergy in himself and in his immediate family. In a few instances, when the inquiry took place shortly after a meal, the pulse-rate was observed. This latter evidence was helpful, of course, only when the rate was high enough to be considered probably food-allergic. The results of this examination are shown in Tables XXIV and XXV.

Among the group of 51 persons who were subject to colds, there were three (W. K., W. Kw., and A. W.) who presented no personal history of food-allergy; however, the high pulse-rate of 96 observed in two of these men one hour after breakfast marks them as most probably food-allergic. N. G., J. H., and P. P. gave a bilateral negative family history of symptoms of food-allergy, yet there is no doubt that all three are themselves food-allergic. The strongest point of evidence of food-allergy in C. C. is the bilateral family

* Paul, J. H. and H. L. Freese: *Am. J. Hyg.*, 17.517, 1933.

† Brown, E. E.: *Bull. U. S. Army Med. Dept.*, 6:79, 1946

‡ If the question should arise as to whether some of the group of cold-susceptible persons were individuals with perennial allergic coryza, it can be pointed out that since the group was not self-selected, but chosen at random, not more than 2 per cent (at most one or two individuals) could be expected to be so affected. Incidentally, one of the cold-free group has had allergic coryza in the winter, which has been controlled by specific treatment. This employee never mistook her condition for common cold.

The cold-susceptible persons presented typical histories of an acute infectious coryza both as to clinical course and as to the characteristic change in the exudate.

theria than with infections of the type observed as a result of invasion from the lungs and intestines in dogs and rabbits during transient exhaustion[6] and shock.[7]"

In a more recent study[8] Locke has confirmed his general thesis that "low-grade infection (such as common cold) gains foot-hold because of impairment in the ability of the defense mechanisms to *function*." In this study he has used a method which spares the individual the physical strain that was involved in the determination of the oxygenation rate. This method requires the person merely to inhale 5 per cent carbon dioxide for one to two minutes. The inhalation of 5 per cent carbon dioxide causes a "measurable, reproducible and characteristic increase in the depth of breathing."

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These findings indicate that susceptibility to common cold is

[6] Bailey, G. Howard: Accessory Etiologic Factors of Respiratory Infection in Rabbits. II. The Effect of Fatigue on the Susceptibility of Rabbits to Intranasal Infection with Type I Pneumococcus, *Am. J. Hyg*, 9:102, 1929; Boycott, A. E., and Price-Jones, C.: Experiments on the Influence of Fatigue on Infection, *J Path & Bact.*, 29:87, 1926

[7] Boone, T. H., Chase, E. M., and Brink, H. E.: Intestinal Absorption of B prodigiosus, *Proc. Soc. Exper. Biol. & Med.*, 29:113, 1931.

[8] Locke, A.: Nonspecific Factors in Resistance. V. Carbon Dioxide Tolerance, *J. Immunol.*, 39:441, 1940.

TABLE XXIV (Continued)

J. G.	Several		x	x	x	x							M headaches	
T. H.	Some	81		x								x	Bilateral	
J. H.	1		x'	oo									Negative	
P. H.	Some			x	x								Parents ?; sister positive	Sister has headaches, heartburn, dizziness, nervousness
J. H.	3 or more			oo	x								Unilateral	
F. J.	Some			x		x		x					Bilateral	
W. K.	1	96											Bilateral	
W. Kw.	1	96											M headaches, neuralgia	
R. K.	2?		x	x	x								Unilateral	
H. L.	Some[2]		x	oo	x						x		M hives	
N. L.	Some		x										Bilateral	
E. M.	2			x	x		x						Unilateral	
H. M.	2 or more			x									?	
S. M.	Some	9[8]	x										Unilateral	
P. P.	1	108									x[8]		Negative	
J. P.	Some			x		x							?	
A. R.	Some		x					x			x		?	
D. S.	Some		x					x					?	
T. S.	Some			x									M ?; F headaches	
M. S.	Some		x		x					x			?	
J. T.	Some			x						x			M heartburn, tiredness	
C. T.	Some			x		?	x	x	x	x	x	x	Bilateral	
E. V. L.	Several	100								±	±		F ?; M positive	Patient has dermographia and constipation
A. V. V.	Some		x	x		x							Bilateral	
H. Z.	2			x	x		x			x	x		M positive	
A. W.	2 or 3	72											?	Probably not food-allergic
C. C.	1	72				x							Bilateral	Questionably food-allergic
H. H.	1	68				x							M headaches	Questionably food-allergic
B. R.	Some				x								M asthma; sibs indigestion	Questionably food-allergic
E. W.	2			oo						x			?	Questionably food-allergic

[1] M = mother; F = father.
[2] Sore throats.
[3] oo = occasionally.
[4] Leg.
[5] Nausea.
[6] Crab.
[7] Orange
[8] also boils.
[9] Facial.

TABLE XXIV

Incidence of food-allergic symptoms in persons susceptible to colds

Name	Colds Each Year	Pulse-Rate 1 to 2 Hours After Meal	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Physical Tiredness	Family History Parents or Sibs	Remarks
L. W.	2			x	x	x							M[1] negative; F[1] ?	
R. G.	1, not bad		x	x									M nervousness; F?	
V. W.	x[2]	64		x		x	x	x		x			M headaches, indigestion	
W. M.	oc[3]		x	oc[3]										
D. S.	1			x		x	x		x				?	
J. L.	1											x	Unilateral	
D. P.	1			x	xx								?	Has hay-fever, Mother has all symptoms
E. K.	1			x	x	x							?	
N. G.	2			xx						x		x	?	
A. B.	Few, never bad	100		oc		x					x[4]		Negative	Milk causes constipation
J. B.	Some					x	x	?				x	?	
L. B.	Many		x	oc	x	x[3]	x			x			?	
E. B.	Some			x				x		x		x	Bilateral	Mother and father have same symptoms
J. C.	2			x	x	x	x						Bilateral	
H. C.	Colds	94	x	x			x							Same symptoms excepting canker-sores
F. C.	2-3	86		x		x							?	
J. C.	2			oc					x[4]		x		? M negative; F gastric ulcer	
H. L.	4	86		oc									?	
L. G.	Some	x	x	x						x			Bilateral	
C. G.	Some	100		x	x					x			Unilateral	
J. G.	2+			x				x	x	x x	x	x	? Bilateral	

TABLE XXV (*Continued*)

E. B.	None												Negative	
J. B.	None												?	Sib hives
M. B.	None												Negative	
H. C.	None												Negative	
Dr. D.	None												Negative	
W. D.	None												Negative	
O. E.	None												Negative	
A. F.	None												Negative	
L. F.	None												Negative	
M. F.	None												?	
N. G.	None												Negative	
C. H.	None												Negative	
J. J.	None					?							Negative	
M. L.	None					?							Negative	Fullness on excessive eating
C. L.	None												?	
S. P.	None												Negative	
F. B.	None												Negative	
E. K.	None												?	Facial neuralgia 14 years ago
A. F.	None			x^{4}									?	Questionable
M. S.	None	78		x^{4}									? Sibs negative	Questionable case
E. W.	None							x^{3}		x^{3}			Negative	Possibly allergic
A. K.	None			$oc^{1,3}$									Negative	Questionably allergic
E. D.	None		x^{4}	x^{4}					x^{7}				M Indigestion	Undoubtedly mildly allergic
D. S.	None	56	x^{5}										?	Undoubtedly mildly allergic but avoids tomato
D. C.	None	64		oc									Negative	Probably mildly allergic; formerly had colds
A. S.	None	92		oc									Negative	Undoubtedly allergic
E. W.	None	80	x										Bilateral	Undoubtedly allergic
E. P.	None									x		x	M headaches; F ?	Probably allergic
J. G.	None			x^{3}				x^{5}		x^{5}			Bilateral	Probably mildly allergic

[1] oc = occasionally.
[2] M = mother; F = father.
[3] With eyestrain.
[4] Very seldom
[5] At periods.
[6] Formerly, not now.
[7] Colitis one summer.
[8] Only from tomatoes.

TABLE XXV

Incidence of food-allergic symptoms in persons not susceptible to colds

Name	Colds Last 3 Years	Pulse-Rate 1 to 2 Hours After Meal	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Physical Tiredness	Family History Parents or Sibs	Remarks
B. P.	None												Unilateral	
F. P.	None												Negative	
A. R.	None												Negative	
S. R.	None												Negative	
H. S.	None												Negative	
W S	None							oc[1]					?	High blood pressure
W. S.	None												Negative	
J. V.	None												Negative	
Mrs. J V	None												Negative	
D V H.	None												Negative	
W. W.	None												?	3 sisters negative
J R.	None												Negative	3 sisters negative
J K.	None	56									?		M[2] negative; F[2] ?	
L. M	None												M negative; F ?	
A. S.	None												Negative	Asthma
M. M.	None			x[3]									Negative	Sore throat this winter; no cold
A. S.	None												M?; F negative	
B. K.	None			x[3]									Negative	Father gassed twice
G S.	None												Negative	Three years ago bronchitis and pleurisy
C. L.	None												?	3 sibs negative; wife and son (aged 18 years) headaches
M. A.	None												?	Hay-fever
F. B	None												?	
J B.	None												M dizziness, nervousness; F negative	

Table XXV (*Continued*)

E. B	None												Negative	
J. B	None												?	
M. B	None												Negative	Sib hives
H. C	None												Negative	
Dr D	None												Negative	
W. D	None												Negative	
O. E.	None												Negative	
A. F	None												Negative	
L. F	None												Negative	
M. F.	None												?	
N. G	None												Negative	
C. H	None												Negative	
J. J.	None												Negative	
M. L.	None					?							Negative	
C. L.	None					?							?	Fullness on excessive eating
S. P.	None												Negative	
F. B.	None												Negative	
E. K.	None												?	Facial neuralgia 14 years ago
A. F.	None			x^4									?	Questionable
M. S.	None	78		x^4									?	Questionable case
													Sibs negative	
E. W.	None							x^6		x^8			Negative	Possibly allergic
A. K.	None			$oc^{1,2}$									Negative	Questionably allergic
E. D.	None		x^3	x^4					x^7				M Indigestion	Undoubtedly mildly allergic
D. S.	None	56	x^3										?	Undoubtedly mildly allergic but avoids tomato
D. C.	None	64		oc									Negative	Probably mildly allergic; formerly had colds
A. S.	None	92		oc									Negative	Undoubtedly allergic
E. W.	None	86	x										Bilateral	Undoubtedly allergic
E. P.	None									x		x	M headaches; F ?	Probably allergic
J. G.	None			x^6				x^5		x^6			Bilateral	Probably mildly allergic

[1] oc = occasionally.
[2] M = mother; F = father.
[3] With eyestrain.
[4] Very seldom.
[5] At periods.
[6] Formerly, not now.
[7] Colitis one summer.
[8] Only from tomatoes.

history of food-allergy. The evidence of food-allergy in H. H., B. R., and E. W. is weak.

Acknowledging the possibility that A. W., C. C., H. H., B. R., and E. W. were not food-allergic, one may draw from these data the conclusion that a large proportion, probably about 90 per cent, of cold-susceptible persons are food-allergic. Among the 52 persons who had had no colds in the seasons of greatest risk of 1939–1940, and who reported having had no colds in the previous two years, 31 reported a negative family history, as contrasted with three such persons among the cold-susceptible group. Two others had sisters or brothers all of whom were free from food-allergic symptoms. Five others reported a negative history in one parent. Twelve were unable for one or another reason to inquire of either parent about the matter, and only two gave a bilaterally positive family history of food-allergy, as contrasted with 11 such persons in the cold-susceptible group.

The last seven of the cold-free group are no doubt food-allergic, but mildly so, excepting possibly A. S. and E. W. The preceding four are questionable with regard to food-allergy.

The comparison of the data in Tables XXIV and XXV hardly permits any doubt as to the important role of food-allergy in predisposing the person to common cold. Granting this conclusion, one can now appreciate fully Locke's application to his problem of the scientific method, in both design and technique, and also the accuracy of his deductions.

Throughout his study Locke seems to have been quite in the dark as to the nature of the original causes of the "nonspecific factors" of whose existence he was collecting such convincing evidence. Although the thought of allergy as a possible nonspecific influence evidently crossed his mind, it seems to have been set aside, no doubt because he was not aware of the large incidence of that state and had no method of detecting its presence.

Particularly illustrative of his correct insight is his forthright assertion: "Probable nonspecific predisposition to common cold, at the time of test, is not identical with the probable future incidence." In the light of the results of our own investigation, this statement may be paraphrased as follows: the food-allergic state, which usually predisposes to common cold, may be present at the

time of test in some persons who are not cold-susceptible (see last seven cases in Table XXV).

For the question: What is the nature of the nonspecific predisposing cause of common cold? there is a suggestion that arises out of a very commonly observed phenomenon in food-allergic persons: namely, the rapid increase and equally rapid loss of weight which sometimes is noticed at the onset of allergic headache and as the attack passes off. Some observers have reported that the loss of weight has been associated with an increase in the excretion of urine.

I have noticed this phenomenon in several persons with food allergy whose symptoms were relieved by avoidance of the allergenic foods. In two persons, J. G. and A. P., urticaria was an outstanding symptom. After the allergenic foods were identified and eliminated, there was a permanent loss of several pounds in weight, although the diet was ample and well balanced and the general health was decidedly improved in both individuals. The rapid loss of weight in these cases is, of course, due to the withdrawal of fluid from the edematous tissues similar to that described by von Pirquet and Schick in the recovery from serum disease. This phenomenon is not limited to cases of urticaria or so-called angioneurotic edema. The allergic infiltration of fluid into tissues is usually so distributed as not to be grossly perceptible.

From the foregoing considerations it is seen that in those cold-susceptible persons in whom food-allergy is a predisposing cause of the susceptibility, the "nonspecific factor" of Locke may be the effect of allergic edema. This suggestion has some support in earlier published observations, as interpreted by Hoelzel[9] and others. A number of investigators[10–15] have reported that the in-

[9] Hoelzel, F · Diet and Resistance to Colds, *Science*, 88:399, 1937.
[10] Hoelzel, F · Nutritional Edema and Its Relation to the Incidence of Common Colds, *Proc Soc Exper Biol & Med*, 25:454, 1928.
[11] Hoelzel, F · A Relation Between the Incidence of Common Colds and Nutritional Hydration, *Science*, 68:301, 1928.
[12] McQuarrie, I · Protein Metabolism of Children on Diets Extremely Low in Carbohydrates, *J Nutrition*, 2:31, 1929.
[13] Higgins, H. L · Some Physiological and Clinical Effects of High Fat Feeding, *New England J Med*, 203:145, 1930.
[14] Orr, J. B and Gilks, J. L · Studies on Nutrition: The Physique and Health of Two African Tribes, Medical Research Council, *Special Report No. 155*, 1931.
[15] Paton, J. H. P · Relation of Excessive Carbohydrate Ingestion to Catarrhs and Other Diseases, *Brit. M J*, 1:738, 1933.

cidence of colds is reduced by restriction of carbohydrate consumption. Hoelzel,[10] McQuarrie,[12] and Higgins[13] attributed the reduction in the number of colds to an observed lessening of tissue hydration.

Observations of Associates of Arthur P. Locke[14]

These investigators, in a prolonged study of 417 college-girls, determined the *number* of food-allergic symptoms exhibited by each individual; the numerical results were checked in independent inquiries conducted by two examiners. The number of colds experienced by each student in one year was established through periodic inquiry and the relationship between number of symptoms and number of colds was determined. Table XXVI is *the summary of these data taken from Table 4 of the authors'* report in the *Journal of Immunology*, February, 1943, p. 108.

Table XXVI

Number of Symptoms	Number of Persons	Number Reporting the Indicated Number of Colds					Average Number of Colds
		0	1	2	3	4-7	
0–1	36	13	13	9	1	0	0.94 ± .08
2–3	121	24	43	28	19	7	1.54 ± .08
4–5	131	20	42	42	19	8	1.68 ± .08
6–7	88	4	30	26	13	15	2.22 ± .10
8–9	24	1	6	4	5	8	2.06 ± .22
>9	17	1	1	3	4	8	3.41 ± .29

It is seen that the greater the number of food-allergic symptoms exhibited by the individual the more colds she was likely to experience. The authors found also that addiction to smoking increased the susceptibility to colds. They did not inquire into the question whether this effect also may be allergic.

The authors state: "The findings at Stephens College would seem to check, at every point tested, those on which Coca based his suggestion that nonreaginic food-allergy may be a major factor in predisposition to common cold."

[14] Brown, Graham, Niedringhaus and Locke *J Immunol*, 46 101, 1943, Brown and Locke: *J. Missouri State M. A.*, p 99, April, 1943

TABLE XXVII

Frequency with which hives, heartburn, etc., were reported as a recurring experience by the persons questioned in the contrasted control and polio groups

Symptom Weight (as an indication of tendency to food-allergic reaction)	Percentages Subject to Hives, Heartburn, etc.					
	Control Group			Polio Group		
	Male	Female	Combined	Male	Female	Combined
(1) Hives	16	20	18	13	27	19
(0) Heartburn	19	10	15	14	13	14
(1) Canker-sores	60	64	62	54	63	58
(1) Constipation	4	9	6	20	35	27
(1) Rhinitis	17	21	19	27	29	28
(1) Nervousness	6	11	8	8	21	13
(0) Stammering	10	4	7	9	6	8
(0) Enuresis	7	7	7	28	16	23
(0) Asthma	10	4	7	1	7	4
(1) Headaches	29	23	26	43	34	38
(1) Indigestion	30	30	30	32	41	36
(1) Tiredness	5	12	8	15	21	18
(1) Dizziness	29	23	26	14	25	19
(0) Hemorrhoids	0	0	0	4	6	4
(1) Neuralgia	15	21	18	33	33	33
(0) Hay-fever	25	14	19	5	9	7
(0) More than two colds per year	47	43	45	58	56	57
(0) % with not more than 1 cold per year and no rhinitis	—	—	17	—	—	9
(2) Pulse above 84	11	16	13	30	33	31
Total Number	126	120	246	142	107	249

	Control Parent Group (137)	Polio Parent Group (399)
(1) Parent with a total symptom weight 2 or more*	64	90
Percentages of the control and polio groups with a total symptom weight of 2 or more*	71	100
Pearl River Students	67	—

* Maximum pulse above 88 in pulse-range test, or pulse-range exceeding 14, also given a weight of 2 in the absence of pulse above 84—for the computation of total weight only

2. ANTERIOR POLIOMYELITIS

The establishment of idioblaptic allergy as the sole predisposing cause of common cold suggested the consideration of other infections which might be classified as "low grade" according to

Locke's definition. Among such possibilities, attention was *focused first upon anterior poliomyelitis.*

The low-grade infectiousness of the virus of poliomyelitis was suggested by the fact that only a small percentage of the population suffers serious consequences (paralysis, death) of the disease, although it can be assumed that most other persons have suffered an unrecognized infection with the virus. This assumption is drawn from the reported estimation, which is considered "reasonable" by John R. Paul,[17] that about 90 per cent of the population carry antipolio-antibodies in their blood. (The 90 per cent figure also reminds one of that 90 per cent of the population who are susceptible to the virus of common cold.)

TABLE XXVIII

Showing marked difference in the incidence of seven allergic manifestations among the polio cases and the controls

Symptom	Polio Cases (249), Per Cent	Controls: Minneapolis (246), Per Cent	Controls: Pearl River (269), Per Cent
Enuresis	23	7	7
Constipation	27	6	12
Abnormal tiredness	18	8	9
Pulse over 84	31	13	—
Rhinitis	28	19	14
Neuralgia	33	18	15
Headaches	38	26	20

In the fall and winter of 1948–1949 the relationship of idioblaptic allergy to the susceptibility to poliomyelitis was studied in Minneapolis from the Sister Elizabeth Kenny Foundation, under Locke's direction.[18] There, as at Stevens College, all individuals included in the survey, and their parents, were questioned as to any common idioblaptic symptoms that they had experienced.

Two groups were examined; 249 individuals of ages ranging from three to 45, who had suffered paralytic manifestations of poliomyelitis and 246 high school students who had never shown any clinical signs of that infection. It happened that at the same

17 Personal communication.

18 Locke, Arthur P. and Coca, Arthur F.: *Ann. Allergy, 8:*26, 1950.

time a similar survey was being made by another experienced investigator among 269 high school students in Pearl River, N. Y. The results of this survey were used as a second control.

Table XXVII presents a summary of the survey. Referring to this table in a personal communication, Locke writes:

"The figures are, I believe reasonably dependable. There is close agreement between the control and polio groups on several bases (hives, heartburn, canker sores, stammering, asthma, indigestion, dizziness). This closeness of agreement could not have been obtained excepting on a basis of uniformity of questioning and interpretation."

However, the incidence of other symptoms is markedly different in the two groups, and it is *always greater* in the polio group. The symptoms whose incidence differed widely in the two groups are listed in Table XXVIII. Included in the table are the corresponding figures obtained in the similar Pearl River survey. Referring to these divergences, Locke remarks: "They may suggest a *type* of shock reaction to the allergic stimuli that possibly has greater predisposing effect vs. polio than the type of shock-reaction that finds reflection in hives, etc."

Locke's brilliant demonstration of the importance of idioblaptic allergy as a predisposing influence in poliomyelitis carries with it the first constructive suggestion for the prevention of the serious consequences of that infection. The problem *together*, with the parent-problem of the idioblaptic allergy itself has arrived at the door of the public health agencies.

Locke's definition. Among such possibilities, attention was focused first upon anterior poliomyelitis.

The low-grade infectiousness of the virus of poliomyelitis was suggested by the fact that only a small percentage of the population suffers serious consequences (paralysis, death) of the disease, although it can be assumed that most other persons have suffered an unrecognized infection with the virus. This assumption is drawn from the reported estimation, which is considered "reasonable" by John R. Paul,[17] that about 90 per cent of the population carry antipolio-antibodies in their blood. (The 90 per cent figure also reminds one of that 90 per cent of the population who are susceptible to the virus of common cold.)

TABLE XXVIII

Showing marked difference in the incidence of seven allergic manifestations among the polio cases and the controls

Symptom	Polio Cases (249), Per Cent	Controls: Minneapolis (246), Per Cent	Controls: Pearl River (269), Per Cent
Enuresis	23	7	7
Constipation	27	6	12
Abnormal tiredness	18	8	9
Pulse over 84	31	13	—
Rhinitis	28	19	14
Neuralgia	33	18	15
Headaches	38	26	20

In the fall and winter of 1948–1949 the relationship of idioblaptic allergy to the susceptibility to poliomyelitis was studied in Minneapolis from the Sister Elizabeth Kenny Foundation, under Locke's direction.[18] There, as at Stevens College, all individuals included in the survey, and their parents, were questioned as to any common idioblaptic symptoms that they had experienced.

Two groups were examined; 249 individuals of ages ranging from three to 45, who had suffered paralytic manifestations of poliomyelitis and 246 high school students who had never shown any clinical signs of that infection. It happened that at the same

[17] Personal communication.
[18] Locke, Arthur P. and Coca, Arthur F.: *Ann. Allergy, 8:26, 1950*

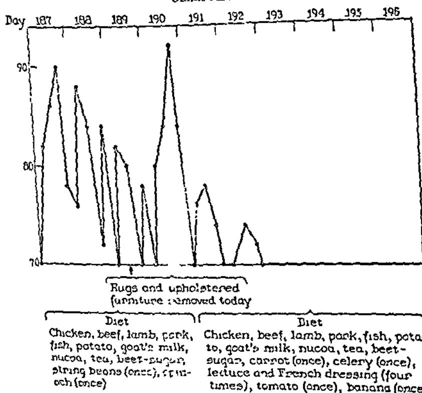
TABLE XXIX

Record of pulse-rate and clinical symptoms following inhalation of divan-dust by patient M. A.

Pulse-Rate		Pulse-Rate	
Just Before Inhaling Dust	80*	25 min.	92‡
5 min.	86†	1/2 hour	90
10 min.	92†	1 hour	82°
15 min.	86†	1 1/4 hours	74°
20 min	90†		

* Pulse strong.
† Pulse weak; feel weak and slightly dizzy.
‡ Pulse still weak; sneezing attacks.
° Symptoms nearly gone.
Note. continued working on divan during first half-hour.

CHART XIV



Showing specific nonreaginic sensivity to dust.

CHAPTER XIV

*Dust-Seal**

Its Use in the Avoidance of "House-Dust" by Dust-Sensitive Persons

NONREAGINIC DUST-SENSITIVITY

THE EXISTENCE OF nonreaginic sensitivity to "dust" was first observed simultaneously in two cases. Patient M. A., a subject of bronchial asthma, with no transferable reagins for "house-dust" nor for eight foods that caused a specific tachycardia, had been briefly but markedly improved by exclusion of allergenic foods from his diet and by avoidance of aluminum. Later, however, he began to experience attacks of asthma with accompanying tachycardia that could not be ascribed to any of the foods he was eating. The idea of an environmental excitant was thus suggested.

The patient then subjected himself to two tests, both of which tentatively confirmed the above-mentioned suggestion. First he noticed that when he inhaled the dust from the rug in his living-room (slapping it with the palms of his hands) an attack of asthma promptly followed and with this there was a rise of the pulse-rate. Sometime later he deliberately inhaled a "large amount of dust" from a divan, which he was repairing. The record of pulse-rate and clinical symptoms is shown in Table XXIX.

Patient G. F. B., referred to above, had for about four weeks been exhibiting daily accelerations of the pulse that could not be referred to any item of her diet. These increases occurred usually in the late afternoon and evening when she was in her apartment. Finally dust came under suspicion and her rugs and upholstered furniture were removed. On the day after the removal the pulse-rate reached a relatively high maximum, due apparently to the

* Dust-Seal is the trade name of a product of L. S. Green Associates, Air Sanitation Products, 160 West 59th St., New York 19, N. Y.

contamination, in an endeavor to minimize the acute respiratory infections among all personnel in test areas, were first studied by Van den Ende and Andrewes[6,7] in England and later by the U. S. Army and Navy. The best procedure was determined to be the use of absorptive oils as a means of choking off secondary reservoirs. This might take the form of depositing an oil imperceptibly on floors or in fabrics, or both, depending upon the environment. A hospital, for instance, on account of the volume of textiles used, can take full advantage of the new practice.

"No bactericidal action is claimed or contemplated in the application of modern oiling methods. The absorption and retention obtained, however, is quite high. Dr. Henry Wise, former member of the Commission on Air-Borne Infections, reports that the reduction in the number of bacteria which could be liberated from a treated blanket amounts to 75 to 95 per cent as compared to an untreated blanket exposed for the same period of time under similar surroundings. These foreign particles (bacteria, dust) can be easily removed with soap and water in a normal washing operation; but wool has the peculiar property of retaining a large portion of the recommended oils after *water washing*, so that very little re-introduction of the oil is necessary. However, the oil would be completely removed with dry cleaning. Cottons behave differently; a larger portion of the oil is removed by water washing and, therefore, a larger portion must be put back. The above-mentioned determination of retentivity was made with the suction of a vacuum cleaner and by dropping steel balls on contaminated blankets over exposed Petri dishes.

"Working in barracks and hospital wards under conditions of adequate control, the investigators report reductions in bacterial counts (taking them both by plates and Folin bubbler samplers) of 50 to 90 per cent. This improvement in air purity was accompanied by fewer hospital admissions at Camp Carson, Colorado,[8] than in the group used for control (5,750 men in both areas). In this project not only floors, the oiling of which reduced bacterial dispersion by 70 per cent during hours of maximal activity, but also blankets, mattress covers, sheets and pillow cases were treated. The impregnation of the fabrics alone added another 10 per cent to the bacterial reduction.

larger content of dust in the air of the room stirred up by the removal (made in the month of February when airing of rooms is limited).

After two days of milder effects the pulse-rate returned to normal, several foods being restored to the diet that had been temporarily withdrawn (Chart XIV).

In another publication[3] a few instances of nonreaginic sensitivity to that mysterious inhalant allergen known to allergists as "house dust" are described, in which the dust-proofing of bedding and upholstered furniture alone markedly lessened the patient's symptoms. However, the circumstances in one of these (A.F.C.) indicated a continuing, if lessened, exposure to dust, the effects of which were serious enough to suggest the installation in the house of a fiber-glas air filter for the removal of dust originating elsewhere than in the bedding and upholstery.

The clinical result of this measure was highly gratifying; the average blood pressure was reduced from 149/81.7 to 142.5/76, and the patient was free from chest pain, conjunctivitis, and gastrointestinal disturbance—this in spite of his living in the house, whereas he had previously been obliged to live in the partly closed-off sunporch.

There remained the inconvenience of his having to shun the house during the several hours following the periodic vacuuming, while the filter was running for the removal of the scattered dust particles which had escaped the cleaner. On some occasions it was necessary for the patient to be in the house during this operation or too soon afterward. These happenings were regularly followed by immediate chest discomfort and by diarrhea on the next morning, and these frequently recurring sequences suggested that allergenic "dust" may originate also in the floor coverings.

It was at this juncture in November, 1947, that I had a conversation with Mr. Leonard S. Green, concerning the remarkable properties of a product of this organization in the reduction of the bacterial content of the air in enclosed rooms and the consequent lessening of infections in the personnel occupying them.

Mr. Green has kindly contributed the following summary of information concerning this matter.

"Effective means for controlling the bacterial-dust phase of air

contamination, in an endeavor to minimize the acute respiratory infections among all personnel in test areas, were first studied by Van den Ende and Andrewes[6,7] in England and later by the U. S. Army and Navy. The best procedure was determined to be the use of absorptive oils as a means of choking off secondary reservoirs. This might take the form of depositing an oil imperceptibly on floors or in fabrics, or both, depending upon the environment. A hospital, for instance, on account of the volume of textiles used, can take full advantage of the new practice.

"No bactericidal action is claimed or contemplated in the application of modern oiling methods. The absorption and retention obtained, however, is quite high. Dr. Henry Wise, former member of the Commission on Air-Borne Infections, reports that the reduction in the number of bacteria which could be liberated from a treated blanket amounts to 75 to 95 per cent as compared to an untreated blanket exposed for the same period of time under similar surroundings. These foreign particles (bacteria, dust) can be easily removed with soap and water in a normal washing operation; but wool has the peculiar property of retaining a large portion of the recommended oils after *water washing*, so that very little re-introduction of the oil is necessary. However, the oil would be completely removed with dry cleaning. Cottons behave differently, a larger portion of the oil is removed by water washing and, therefore, a larger portion must be put back. The above-mentioned determination of retentivity was made with the suction of a vacuum cleaner and by dropping steel balls on contaminated blankets over exposed Petri dishes.

"Working in barracks and hospital wards under conditions of adequate control, the investigators report reductions in bacterial counts (taking them both by plates and Folin bubbler samplers) of 50 to 90 per cent. This *improvement in air* purity was accompanied by fewer hospital admissions at Camp Carson, Colorado,[6] than in the group used for control (5,750 men in both areas). In this project not only floors, the oiling of which reduced bacterial dispersion by 70 per cent during hours of maximal activity, but also blankets, mattress covers, sheets and pillow cases were treated. The impregnation of the fabrics alone added another 10 per cent to the bacterial reduction.

"The investigators in England, working in barracks with individuals subject to outside exposures, established an infection rate of 7 per 1,000 in test groups of 1,300 to 1,700 men, as against 38 per 1,000 in the control group, or a difference of about 80 per cent.[1] As yet no similar data in degree of performance have been developed or published in this country.

"Impressed by the apparent efficacy of a microbic glue, to be used as a part of good housekeeping practice, this firm was organized to determine the type of oiling compound needed for civilian environments. The oils used for coating barrack floors were found to be impracticable, since both walk-quality and appearance had to be considered along with labor costs in application.

"The first formula used was an oil mixture, which is easily emulsifiable in water. When the milk-white, odorless emulsion is sprayed or sprinkled to thorough soaking upon rugs or carpets or upholstered furniture, it quickly becomes quite invisible. Since the oil is nonvolatile, the fabric is not made more than usually inflammable.

"The emulsion is quickly prepared, as follows: A suitable pot is filled about two-thirds full (one quart) with warm water from the faucet; place four or five heaping tablespoonfuls of the commercially distributed cream on the surface of the water and emulsify (two to three minutes) with an egg-beater. Make up with water to one gallon and distribute with fine-holed garden watering pot. For effective treatment, rugs and carpets must be thoroughly soaked. Such treatment has not caused noticeable injury to even fine Chinese and Turkish rugs."†

Case Reports

Case 1. The first person with nonreaginic dust sensitivity in whom the protective action of Dust-Seal could be observed was patient A.F.C. This case was most favorable for the purpose of the particular experiment, because of the easily observable, one may even say measurable, consequences of his exposure to dust, which have been described in a previous report.[2]

Dust-Seal was first applied by the patient to the rugs with a "flit-gun" on two successive days. This amounted to a mere surface dampening of the rugs that produced no encouraging change in the average blood pressure. Two months later, on January 15, 1948, all the rugs were thoroughly soaked with the emulsion.

† For more details concerning the treatment of various fabrics with Dust-Seal, see the manufacturer's special literature.

In the period from January 19 through March 25, the recorded blood pressures were:

Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic
122	72	138	74	130	70
132	78	146	68	130	78
130	72	146	70	130	76
136	78	130	78	146	76
136	72	146	80	142	70
126	72	132	68	124	70
138	80				

The average of these readings is 134 5/74.

This reduction of the blood pressure becomes the more significant of a diminished exposure to dust, as a result of the immobilizing effect of Dust-Seal, when the fact is considered that since the Dust-Sealing the use of the air-filter has been entirely discontinued. Moreover, the patient remains in the house while the vacuum cleaner is in operation without experiencing the slightest symptom of his dust-sensitivity.

Case 2. Patient A. B. has been described also in the previous report.* This man's systolic pressure, which had been constantly 180 or higher, had dropped to an average of 158 3 after the dust-proofing of his bedding and upholstered furniture and the installation of a fiber-glas air filter. He was not food-allergic.

On March 5, 1948, the heavy carpeting of the patient's bungalow was thoroughly soaked with the Dust-Seal emulsion under the personal direction of Mr. Green. The average of the previous twenty readings of the patient's systolic pressure was 160 (range 148 to 170). From March 16 to March 25, the daily systolic pressure readings average 143 (range 140 to 148, with one reading of 158).

Case 3. V. H. S. suffered with chronic rhinitis, canker sores, headaches, nervousness and abnormal tiredness. Skin tests showed her to be dust-sensitive; her husband and son had also been found skin-test-positive to dust. However, she has a nonreaginic sensitivity to dust, which is seen in a pulse rate of 102 observed "after making beds." Her normal pulse ranges from 64 to 80. No nonreaginic food sensitivities have been discovered. The patient reported some improvement of her symptoms after replacing her down pillows with air-filled ones.

In March, 1948, she applied dust-proof covers to mattresses, pillows and cushions and wore a dampened mask while dusting and making beds. "This seemed to help a great deal," symptomatically, though the pulse remained generally high and erratic.

Dust-Seal was liberally applied to floor covers about April 20, and a few weeks later "blankets and slip covers were washed and rinsed in the emulsion."

The pulse record of V. H. S. in Table XXX shows the effect of the Dust-Seal on the pulse rate. It is noteworthy that the high rates in March always occurred in the morning, the period of greatest exposure to dust *

* It is also noteworthy in this connection that in the investigation at Camp Carson mentioned in Mr Green's summary, "the bacterial content of the air during the bed-making was 1,200 per cent greater than during a quiet period in the same ward with the same occupancy."

In June the patient wrote, "I am delighted about the improvement of my husband and son—they are both allergic to house dust by skin test, having a hay-fever condition most of the winter. Three times, I have noticed an improvement. First, when I eliminated down pillows and quilts. Second, when I covered the mattresses. Third, when I used the Dust-Seal." As for her own chronic rhinitis, she writes it is "better than it has been for a year."

TABLE XXX

Pulse record of V. H. S. in March after application of dust-proof covers, and in May after application of Dust-Seal

	March				May			
	27	28	29	30	19	22	25	27
Before Rising	60	60	62	60	—	—	—	—
Breakfast			90					
	76	78	80	78	80	82	76	—
	80	90	90	82	76	76	80	—
	90	80	90	84	76	72	74	66
	80	78	—	80				
					76	76	70	80
Cleaning, Making Beds	90	98	100	90	No mask used......			70
	—	92	84	—				
Lunch	76	76	76	—	—	—	—	—
	84	80	82	—	82	78	—	78
	80	84	78	—	80	74	—	80
	—	74	—	—	76	74	—	74
Mid P.M.	—	80	—	—	78		74	73
	—	74	—	—				
	—	74	—	—	—	—	—	—
Dinner	—	74	78	76				
	—	82	80	74	72	74	80	74
	—	80	80	74	74	72	78	78
	—	74	76	74	72	72	76	74

—indicates no record made.

Case 4. M. M., aged 39, had bronchial asthma with chronic rhinitis. She had consulted an allergist who found her skin-test-positive to feathers and cheese; she had received a series of injections. Consulting me on *August 31, 1946*, she reported that she had suffered a severe attack of asthma over several days at the time of her August period (a coincidence that recurred in the next two months). The pulse in these attacks was high (in the nineties from a normal low of about 60). The October attack culminated in an alarming status, making it imperative to all concerned to decide upon the most probable cause of the "attacks" and take appropriate action.

The usual dust and feather precautions had been instituted; there were no food allergens in the diet, and the cutaneous tests to ragweed pollen, as well as to grasses and oak, were quite negative. Inhalation of vaporized ragweed pollen extract caused no asthmatic symptom. The most *likely* cause of the attacks seemed to be an "internal allergen" appearing at the periods. The

patient has two children, and she and her husband agreed to artificial menopause with a series of x-ray treatments, which were administered.

Two further periods were experienced, both accompanied with milder asthmatic attacks and pulse rates up to about 104. Thereafter there were no periods nor frank asthmatic attacks.

However, the chronic rhinitis with mild wheezing continued, and the cause of these symptoms was believed to be house dust, the scratch-test for which caused a 1/2-inch wheal with a two-inch flare.

Installation of a fiber-glas air filter caused no noticeable relief of these symptoms, but they ceased shortly after the thorough Dust-Sealing of the floor coverings on February 15, 1948 Previous to that time the patient had had some symptomatic relief with the use of an "iodide prescription" obtained from another physician. She has not used this since. Five months have passed with no recurrence of any of her symptoms. She remains well three years later.

Case 5. G. M, the four-year-old son of the foregoing patient had had occasional asthmatic attacks previous to the institution of the dust precautions (cutaneous tests have not been done). There was no asthma thereafter, but whenever he played with his teddybear, pushing his nose deep into the fur, he had continuing spells of sneezing. Recently his parents dipped the teddybear into a pot of Dust-Seal emulsion and dried it. Thereafter the boy played with the thing as intimately as before but without ever sneezing.

The experiences here described mark the product Dust-Seal as an efficient, economical, harmless and easily applied immobilizer of allergenic dust in fabrics in which that allergen is presumably generated.

In the cited cases the Dust-Sealing was applied to sources of the allergen which are not closed off by the familiar dust-proofing. However, there seems to be no reason why mattress fillers and also upholstery stuffing cannot be Dust-Sealed, without appreciably increased cost.

There are no reliable statistics from which the incidence of non-reaginic dust sensitivity can be estimated. If it equals that of reaginic sensitivity in the atopic group (about 25 per cent), physicians may reasonably urge the use of only Dust-Sealed bedding and upholstery in all dwellings and hospitals. The simple Dust-Sealing of floor coverings is no problem.

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CHAPTER XV

The Biologic Groupings of Food-Allergens

THIS QUESTION has been considered in writings on reaginic allergy and it is thoroughly discussed in that connection in Vaughan's *Practice of Allergy*. The findings of that line of inquiry by Vaughan are highly inconsistent, warning the practitioner against laying down a general rule that a demonstrated allergic sensitivity to one member of a biological group presupposes such sensitivity to the other members and *vice versa*.

A striking illustration of the fallacy of such a conclusion is found in the reaginic epidermal sensitivity to the cloven-hoofed animal-group—sheep, cow and deer—and to the different varieties of dog

Vaughan refers to crossed cutaneous reactions, observed by Balyeat, to the epidermal allergens of cow and deer. One of my colleagues, Dr. S., is clinically (asthma) mildly sensitive to sheep, more sensitive to cow and markedly sensitive to deer. After a series of injections of an extract of cow's dander only, he was entirely free of symptoms when with any of the three animals mentioned.

Sanford B. Hooker[1] has collected clinical and serologic evidence of the existence of common allergens in the dander of at least most dogs, but in addition to these he could demonstrate allergens in some varieties (boxer, poodle, Scotch terrier) that were not present in the dander of a number of others. Some asthmatic persons are affected by the dander of the three last-named varieties but not by the others, and the serologic study with the serum of such persons yielded consistent information.

The data concerning the relation of biologic grouping of foods to

[1] Hooker, S. B *Annals of Allergy*, 2 281–288, July–Aug, 1944

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idioblaptic allergy are not yet sufficient to permit more than suggestive conclusions.

Gramineae

Twenty-two patients have been found nonreaginically sensitive to some members of this group. Of the 14 that were sensitive to rye, rice or oat, all were sensitive also to wheat. On the other hand, four of the patients found sensitive to wheat were not perceptibly sensitive to rye, rice or oat. A fifth patient suffered migraine after eating wheat but only a moderate tachycardia after eating rye, rice or oat. Two patients were found sensitive to corn but not to any other cereal.

The practical consequences of these findings would seem to be the following:

1. *If a preliminary test shows the patient to be sensitive* to wheat, tests must be made also with corn and with rye, rice or oat.
2. If a preliminary test with wheat results negatively, it can be safely assumed that the patient is not sensitive to the other cereals excepting corn, which must be separately tested.
3. If a test shows sensitivity to rye, rice or oat, a test with wheat may be postponed or avoided entirely, if the patient agrees, *in order to escape a possibly violent reaction.*
4. If the test with rye or rice or oat results negatively, test with wheat and corn should be made.

Citrus Fruit

Among 17 persons found sensitive to one or more members of this family, eight were sensitive to all, seven were sensitive only to orange, one was sensitive to lemon only and one to orange and lemon, not to grapefruit. Among those sensitive to all the citrus fruits one is distinctly more sensitive to grapefruit than to orange.

In practice, then, it seems proper to test first with grapefruit. If the result is positive the test with other citrus fruit is postponed and then left to the discretion of the patient. If the result is negative, a test must still be made with orange.

Leguminosae

Thus far, no exception has been encountered to the rule that persons sensitive to pea are also sensitive to all varieties of bean. It has seemed practical, therefore, to make a group test of pea and bean at one meal, if convenient to the patient. Retest of the varieties can be made separately if the result of the group test is positive.

Peanut should be tested separately since one patient (Mrs. E. B.), who, for a long period, has eaten pea and bean with no perceptible allergic reaction is distinctly allergic to peanut. On the other hand, H. A. S. is allergic to pea-bean but *not* to peanut.

Brassica

(Turnip, rutabaga, mustard, cabbage, Kale, Brussels sprouts, Kohlrabi, broccoli, cauliflower)

Persons found *not sensitive* to any member of this important group have usually been able to eat all of the others and on the other hand, persons found *sensitive* to one of them (cabbage or cauliflower is usually tested) have been advised to avoid all of the others, without further testing. However, G. P., who is allergic to cabbage, does not react to broccoli.

Fish

The findings and advice with respect to this large group are similar to those mentioned with regard to Brassica. Shell-fish are allergenically separate from bony fish.

More exact observations concerning the rose family are needed. Marked sensitivity has been seen in one patient to all the members excepting the berries, which cause not the slightest reaction. Two other patients can eat peach but not plum.

It is seen that the practical use of biologic classification in the specific diagnosis of "nonreaginic allergy" *is limited.* Nevertheless, the diagnostician will be interested in the simplified botanical listing that has been prepared by Sumner Price.

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COMPOSITE FAMILY—*Compositae* (Order, *Campanulatae*)

absinthe*	vermouth*	arnica, arnicin	burdock (Lappa)
artichoke	endive	chamomile	dandelion
chicory	lettuce	grindelia	inula
dandelion	sesame	lettuce	lactucarium
Jerusalem artichoke		santonin	Levant wormseed
salsify (oyster-plant)		boneset	(thoroughwort)
escarolle			

CASSAVA FAMILY—*Europhorbaceae* (Order, *Geraniales*)

cassava	tapioca	cascarilla	
Brazilian arrowroot		croton oil	
manico		stillingia (queen's root)	

BUCKWHEAT FAMILY—*Polygonaceae* (Order, *Polygonales*)

buckwheat	rhubarb	yellow dock (Rumex)	rhubarb

PEA FAMILY—*Leguminosae* (Order, *Rosales*)

black-eyed pea	kidney bean	acacia catechu	broom
lima bean	licorice	acacia Senegal (gum Arabic)	scoparius
lentil	navy bean		balsam of Peru
pea	soy bean	copaiba	senna (cassia)
peanut	string bean	kino	tamarind
		licorice (Glycyrrhiza glabra)	

LILY FAMILY—*Liliaceae* (Order, *Liliflorae*)

asparagus	leek	colchicum	sarsaparilla
chive	onion	convallaria	squill
garlic	sarsaparilla	garlic	veratrum viride

ARUM FAMILY—*Araceae* (Order, *Spathiflorae*)

taro starch	cortland arrow-root (cukoo plant)	sweet flag	

IRIS FAMILY—*Iridaceae* (Order, *Liliflorae*)

Tacca (Hawaiian arrowroot)		orris root	white flag
		saffron (coloring in medicines)	

PARSLEY FAMILY—*Umbelliferae* (Order, *Umbelliflorae*)

aniseed	dill	anise	coriander
caraway	fennel (finochio)	ammoniac	fennel
carrot	*parsley*	apiol	hemlock (conium)
celery	parsnip	caraway	
		asafoetida	sumbul

* From wormwood and other elements.

CHAPTER XVI

List of Foods and Drugs Arranged According to Botanical Origin

BY SUMNER PRICE, M.D.

CEREAL FAMILY—*Gramineae*

Foods		Drugs
barley	oat	wheat, wheat-bran
cane sugar	rice	byne, malt, common barley
corn, maize	rye	corn-silk, zea, starch
millet	wheat	sugar, saccharose
		triticum, couch-grass

MORNING-GLORY FAMILY—*Convolvulaceae* (Order, *Tubiflorae*)

sweet potato		scammony
		jalap

NIGHTSHADE FAMILY—*Solanaceae* (Order, *Tubiflorae*)

chili, cayenne	red peper	belladonna, stramonium
ground cherry	green pepper	capsicum, cayenne
eggplant	tomato	guinea pepper
Irish potato	tobacco	nicotine, pichi
	British arrowroot	woody night shade
		bittersweet (S. dulcamara)

MUSTARD FAMILY—*Cruciferae* (Order, *Rhoeadales*)

broccoli	Brussels sprouts	black mustard
cabbage	cauliflower	white mustard
horse-radish	radish	horse-radish
kale	kohl-rabi	
mustard	turnip	
rutabaga	watercress	

GOOSEFOOT FAMILY—*Chenopodiaceae* (Order, *Centrospermae*)

spinach	beets	chenopodium (American wormwood)
beet sugar (beta vulgaris)		
Swiss chard (sea-kale beet)		

Rose Family—*Rosaceae* (Order, *Rosales*)

almond	apple	blackberry	raspberry
apricot	blackberry	prune	sweet almond
cherry	dewberry	bitter almond	cusso (brayera)
peach	plum	soap (Quillaja)	
pear	prune	wild cherry	
quince	raspberry	red rose (oil of rose, used in flavoring)	
strawberry	sloe		

Palm Family—*Palmaceae* (Order, *Principes*)

betel nut	coconut
date	date-sugar
palm-oil products	
sago	

Elder Family—*Caprifoliaceae* (Order, *Rubiales*)

elderberry	elder (sambucus)
elderberry wine	Cramp bark (viburnum opulus)
	black haw (viburnum prunifolium)
	viburnum ovatum (found in vermouth)

May Apple—*Berberidaceae* (Order, *Ranales*)

may apple	blue cohosh (Caulophyllum)
	mandrake (Podophyllum)

Pineapple Family—*Bromeliaceae* (Order, *Farinosae*)

pineapple

Saxifrage Family—*Grossulariaceae* (Order, *Rosales*)

gooseberry   red currant

Pomegranate Family—*Lythraceae* (Order, *Myrtiflorae*)

pomegranate

Olive Family—*Oleaceae* (Order, *Contortae*)

green olives	ripe olives	olive oil	manna

Tea Family—*Theaceae* (Order, *Umbelliflorae*)

tea	teaseed oil (adulterant of olive oil)	caffeine	tannic acid

Note: Paraguay tea is made from Ilex paraguyensis of the holly family, also called mate. We may expect to find more mate in tea from now on.

Banana Family—*Musaceae* (Order, *Musales*)

banana

Mallow Family—*Malvaceae* (Order, *Malvales*)

cottonseed	cotton
marshmallow	*cotton root bark*
okra	marshmallow (Althea)

Gourd Family—*Cucurbitaceae* (Order, *Cucurbitales*)

cantaloupe	cassaba	bryonia	elaterin
cucumber	honey-dew	colocynth (bitter apple, bitter cucumber)	
pumpkin	squash	pumpkin seed	
watermelon			

Citrus Family—*Rutaceae* (Order, *Geraniales*)

angostura	citrange	angostura (Cusparia)	
grapefruit	kumquat	bitter orange (*C. aurantium*)	
lemon	lime	buchu	rue
orange	tangerine	joborandi (pilocarpine)	
		sweet orange (*C. sinensis*)	
		xanthoxylin (pricky ash)	

Mulberry Family—*Moraceae* (Order, *Urticales*)

bread fruit	fig	fig	hop
bread nut	hop	Indian hemp (Cannabis indica)	
mulberry			

Grape Family—*Vitaceae* (Order, *Rhamnales*)

cream of tartar		grape-sugar
dextrose (grape sugar)		red wine
grapes	raisins	white wine
grape juice	grape wine	acid potassium tartrate

Cola Family—*Sterculiaceae*

kola nut (used for tea)	theobromine	guarana
cocoa	cacao shell	
	cacao butter (used in suppositories)	

Cactus Family—*Cactaceae* (Order, *Opuntiales*)

cactus	prickly pear	pellotine

Heath Family—*Ericaceae* (Order, *Ericales*)

blueberry	cascara sagrada	wintergreen
cranberry	bearberry (*uva ursi*)	
wintergreen	pipsissewa (chimaphila, prince's pine, ground holly, rheumatism weed)	

ROSE FAMILY—*Rosaceae* (Order, *Rosales*)

almond	apple	blackberry	raspberry
apricot	blackberry	prune	sweet almond
cherry	dewberry	bitter almond	cusso (brayera)
peach	plum	soap (Quillaja)	
pear	prune	wild cherry	
quince	raspberry	red rose (oil of rose, used in flavoring)	
strawberry	sloe		

PALM FAMILY—*Palmaceae* (Order, *Principes*)

betel nut	coconut
date	date-sugar
palm-oil products	
sago	

ELDER FAMILY—*Caprifoliaceae* (Order, *Rubiales*)

elderberry	elder (sambucus)
elderberry wine	Cramp bark (viburnum opulus)
	black haw (viburnum prunifolium)
	viburnum ovatum (found in vermouth)

MAY APPLE—*Berberidaceae* (Order, *Ravales*)

may apple	blue cohosh (Caulophyllum)
	mandrake (Podophyllum)

PINEAPPLE FAMILY—*Bromeliaceae* (Order, *Farinosae*)

pineapple

SAXIFRAGE FAMILY-*Grossulariaceae* (Order, *Rosales*)

gooseberry red currant

POMEGRANATE FAMILY—*Lythraceae* (Order, *Myrtiflorae*)

pomegranate

OLIVE FAMILY—*Oleaceae* (Order, *Contartae*)

green olives	ripe olives	olive oil	manna

TEA FAMILY—*Theaceae* (Order, *Umbelliflorae*)

tea	teaseed oil (adulterant of olive oil)	caffeine	tannic acid

Note: Paraguay tea is made from Ilex paraguyensis of the holly family; also called mate. We may expect to find more mate in tea from now on.

BANANA FAMILY—*Musaceae* (Order, *Musales*)

banana

GINGER FAMILY—*Zingiberaceae* (Order, *Scitamineae*)

genuine arrowroot		cardamon	
tulema arrowroot (tous-les-mois) (adulterant of color)		ginger	
ginger	turmeric		

MINT FAMILY—*Labiatae* (Order, *Tubiflorae*)

horehound		catnip	horehound
peppermint		lavender	menthol
spearmint		pennyroyal	peppermint
sage		rosemary	sage
thyme		spearmint	thyme
		thymol	skullcap (scutellaria)

MADDER FAMILY—*Rubiaceae* (Order, *Rubiales*)

coffee		caffeine	ipecac
		cinchona (quinine)	

NUTMEG FAMILY—*Myristicaceae* (Order, *Ranales*)

nutmeg	mace	nutmeg	mace

PEPPER FAMILY—*Piperaceae* (Order, *Piperales*)

black pepper		cubeb	matico
white pepper		black pepper	

ORCHID FAMILY—*Orchidaceae*

vanilla		cypripedium (lady's slipper)	
		salep	vanilla

MYRTLE FAMILY—*Myrtaceae* (Order, *Myrtiflorae*)

allspice	clove	allspice	bay
eucalyptus cider		clove	cajuput
pimenta (paprika)		eucalyptus (blue gum)	
		peppermint gum (resin)	

EBONY FAMILY—*Ebenaceae* (Order, *Ebenales*)

chicle (chewing gum)		gutta percha	
date-plum (persimmon)			

POPPY FAMILY—*Papaveraceae* (Order, *Rhoedales*)

poppy-seed		blood-root	chelidonium
		opium (morphine, codeine)	

LAUREL FAMILY—*Lauraceae* (Order, *Ranales*)

avocado	cinnamon	cinnamon	camphor
sassafras		sassafras	

LIST OF FOODS AND DRUGS

Lecythis Family—*Lecythidaceae*

Brazil nut

Pine Family—*Coniferae*

juniper	Canada balsam	juniper
pine nut (pignolia)	pine	savine
	tar	turpentine

Cashew Family—*Anacardiaceae* (Order, *Sapindales*)

cashew nut	mango	mastic	poison ivy
pistachio		sumach (*Rhus glabra*)	

Beech Family—*Fagaceae* (Order, *Fagales*)

beech nut	chestnut	chestnut (Castanea dentata)
		creosote (Fagus sylvatica)
		white oak (Quercus alba)

Birch Family—*Betulaceae*

hazel nut (filbert)

Walnut Family—*Juglandaceae* (Order, *Juglandales*)

bitternut	butternut	butternut root
hickory	pecan	
shell bark	shag bark	
walnut, black	walnut, English	

Soapberry Family—*Sapindaceae* (Order, *Sapindales*)

litchi nut (Litchi chinensis)

Note: This listing has been approved by Dr Roger P. Wodehouse.

CHAPTER XVII

The Histamine-Theory

UNDERSTANDING of this theory of the ultimate injurious agent in specific sensitivities will be facilitated for some readers by a short historical summary of it.

Two questions were originally joined in the problem: The first concerned the locus of production (humoral or cellular?) of the irritative agent, and the second concerned the nature of that agent. These questions were first studied in anaphylactically sensitized animals.

THE ORIGINAL SITE OF THE ANAPHYLACTIC AND ALLERGIC REACTION

The *"humoral" theory*, which assumed that the injurious agent of anaphylactic reaction is produced in the blood or other body-fluids, could not survive the demonstration that the anti-body-antigen reactions can take place in the blood-stream of the guinea-pig without causing any symptoms whatever. To this evidence was added the similar experiment in *vitro* of Dale and Kellaway,[1] who suspended the uterine strip of the sensitized guinea-pig in a bath of Ringer's solution and, after adding anti-horse-serum to the bath and then horse-serum, observed no contraction of the uterine strip. Similar experiments by Doerr[2] upon the normal uterine strip of the guinea-pig also resulted negatively.

The *"cellular" theory*, on the contrary, is satisfactorily supported by the experimental results in the field of anaphylaxis as well as in that of allergic disease; although it seems not to be applicable in all cases (anaphylaxis in the rabbit and mouse).

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[1] Dale, H. H., and Kellaway, C. H.: *J. Physiol*, *54*:CXLIII (Proc.), 1920-21.
[2] Doerr, R.: *Handbuch der path. Mikroorg.*, *1*:901, 1929.

The Nature of the Irritative Agent

The cellular changes that are caused by the reactions of specific sensitivity have been thought to be brought about by *physical* influences or by *chemical* influences. Doerr[3] (membrane hypothesis) suggested that the specific reaction occurring on the cell-membrane provides sufficient explanation of the irritative reaction on the shock-tissues. Whether this *physical* "irritation" was of electrical or mechanical nature was left in question.

The *chemical* theories concerning the irritation of the shock-tissues of anaphylactic or allergic sensitivity were employed in the search for a nonspecific "poison," which was thought to be produced as a consequence of the antigen-antibody reaction.

Some investigators, especially Victor Vaughan and E. Friedberger, sought the anaphylactic poison in some digestive product of the antigen. Vaughan was thinking of a peculiar proteolytic action of antibody to which he attributed a digestive function, while Friedberger looked upon complement as the digestive agent.* Powerful arguments against these theories were brought by Doerr and Dale.

Doerr pointed out that the lethal quantity of a proteic anaphylactogen does not contain sufficient of even its most poisonous derivative to cause an anaphylactoid reaction, such as that which can be produced in the guinea-pig with histamine. Dale excluded the enzymic derivation of the anaphylactic poison from the antigen by calling attention to the absence of the characteristic slowly rising curve of the fermentative process in the anaphylactic contraction of the sensitized uterine strip. The anaphylactic contraction of unstriped muscle begins typically within 10 to 15 seconds after the addition of the antigen to the bath and may reach its maximum within two minutes. This is exactly the course of uterine contraction when histamine is added to a bath in which the uterine strip of a normal or sensitized guinea-pig is suspended.

If the anaphylactic poison could not be thought to be a derivative of the antigen, it had to be sought in the cells in which the effective antigen-antibody reaction occurs (the cells of the shock-

[3] Doerr, R.: *Handbuch der path. Mikroorg.*, 1:901, 1929

* Vaughan used the expression "protein poison," and Friedberger the term "anaphylatoxin" to designate the anaphylactic irritant.

tissues). Moreover, since an enzymic production of the poison was excluded (Dale), it had to be present in the tissues *preformed.*

The identification of histamine as this preformed cellular "poison" of anaphylactic shock is the contribution of Dale and his associates and the application of the principle in explaining the production of a typical lesion of human allergic disease, the wheal, is that of Thomas Lewis and his coworkers.

Dale,[4] in his well-known paper with Laidlaw, had suggested the significance of histamine in the specific reactions of sensitized animals and at the same time had, with Barger, isolated that substance from normal intestinal mucous membrane. He wrote at that time, "It seems highly probable that the same base would be found in similarly acting extracts of other organs." In the following 20 years histamine, identified by various methods, was reported as present in varying quantities in lung, liver, muscle, brain, heart, spleen, blood and skin.

It is of especial significance for the histamine-theory that the recovery by Best, Dale, Dudley and Thorpe[5] of chemically identified histamine from the organs of an anaesthetized living animal was accomplished with a method that clearly precluded a chemical derivation from cellular protein and so justified the assumption of these investigators that the histamine thus obtained had existed preformed in the tissues.

These experiments, then, taught us in a reverse order, first, that preformed and loosely bound histamine exists in the body-tissues and, secondly, that free histamine is capable of producing symptoms scarcely distinguishable from those of acute anaphylactic shock.

Let us now examine the pertinent studies of Thomas Lewis and his associates in human allergic reactions.[6]

It is quite impossible, within the limitations of space imposed by the special circumstances of this presentation, to do justice to these remarkable investigations. The brief statement of the conclusions bearing upon our immediate problem with which I must

[4] Dale, H. H., and Laidlaw, P. P.: *J. Physiol.*, *41*:318, 1910.
[5] Best, C. H., Dale, H. H., Dudley, H. W., and Thorpe, W. V.: *J. Physiol.*, *62*:397, 1927.
[6] Lewis, Thomas: *The Blood Vessels of the Skin and Their Responses.* London, lit., Shaw and Sons Ltd., 1927.

content myself will, of course, not convey to the reader the wealth of varied observations and the brilliancy of their analysis upon which Lewis has rested those conclusions.

1) In the production of the experimental allergic wheal there are three distinct events ("triple response").
   (a) A primary and local dilatation of the minute vessels of the skin.
   (b) A widespread dilatation of the neighboring strong arterioles (flare) brought about entirely through a local nervous reflex, and
   (c) Locally increased permeability of the vessel walls (resulting in the formation of the edematous wheal).
2) This cycle of development is seen in the local reaction to the intracutaneous injection of histamine, in the reaction to stroking in the skin of a subject with dermographism, and in the reaction to intracutaneous injection of the specific excitant in an allergically sensitive person.
3) Through a variety of comparative experiments with the production of the histamine wheal and the allergic wheal (induced by stroking in subjects with dermographism), it could be shown that the primary cause of the triple response could not be nervous nor a mere cell-injury. It was necessary to postulate the release from the injured cells of a diffusible chemical irritant having the properties of histamine. This substance was conservatively named "H-substance."

In the period in which the significance of histamine in the causation of the phenomena of specific sensitivities was being uncovered, another line of investigation was taking place, which was destined to have an important part in the explanation of some phenomena of nonreaginic food-allergy and also in the practical alleviation of the symptoms of that condition. These investigations concerned the ability of the animal organism to acquire a tolerance toward the pharmacologic action of histamine.

Fuhner[7] reported that the tolerance of animals to the action of histamine is increased for some days after the injection of large doses. A most illuminating contribution to this subject is found in an entirely neglected study of R. A. Cooke.[8] Cooke gave a series of intracutaneous injections, at intervals of hours, of a solution of histamine (phosphate) in the same site (same puncture orifice) in human subjects. The first injections were of the same quantity of histamine and the intensity of the reactions diminished greatly after the first few injections. The increased tolerance lasted over night and was of such degree that in one instance *a*

[7] Fühner, H.: *München med. Wchnschr.*, 59:852, 1912.
[8] Cooke, R. A.: *J. Immunol*, 7:219, 1922.

solution ten times as strong as the one previously injected produced only a negligibly larger reaction, which itself was considered "questionable" by Cooke.

The same paper describes similar experiments carried out in the skin of a subject of reaginic sensitivity to two pairs of specifically different allergens, horse-epithelium and rabbit-epithelium, horse-serum and rabbit-serum. A site that had been rendered clearly resistant to an extract of horse-epithelium containing 0.05 mg N/ml was found to be slightly less reactive to the strong extract of rabbit-epithelium (0.5 mg N/ml) than the previously unused skin. The quantitative relations were more favorably chosen in the second experiment with the two animal sera. In this experiment a site that had been rendered negligibly reactive to a solution of horse-serum containing 0.1 mg N/ml reacted only very slightly to rabbit-serum in the same dilution.

Since the resistance thus induced toward the specific cutaneous reaction was demonstrably nonspecific, it is permissible tentatively to identify it with the nonspecific tolerance toward histamine, although Cooke did not directly test this by injecting histamine into the sites that had been rendered resistant to the specific reaction. One could consider the possibility that the repeated specific reactions had exhausted the tissue-bound histamine in the site.

The significance of Cooke's experiments that has just been discussed is borne out in the following investigations of the constitutional tolerance to injected histamine. Karády and Bentsáth[9] gave guinea-pigs sensitizing injections of ovalbumin and at the same time began daily injections of histamine, which were continued for two or three weeks. These animals, when tested for anaphylactic sensitivity by reinjection of the antigen, showed much milder reactions (small drop in body-temperature) than did the control animals.

It should be noticed that Karády and Bentsáth did not investigate the possibility that the establishment of the anaphylactic sensitivity (production of precipitin) may have been interfered with by the simultaneous injections of histamine.

L. Farmer[10] carried out a similar experiment but did not begin

[9] Karády, St. and Bentsáth, A.: *Ztschr. f d. ges. exper. Med.*, *100*:48, 1936
[10] Farmer, L.: *J. Immunol*, *36*.37, 1939

the treatment with histamine until the anaphylactic sensitivity was certainly established, 13 to 15 days after the sensitizing injection. When, between the 26th and the 36th days, the uterine strips of these animals were quantitatively tested with dilutions of the antigen, 78 per cent of them required concentrations greater than 1–250,000 to cause their specific reaction and half of these needed concentrations greater than 1–500. In contrast with this result, 65 per cent of the uterine strips of the similarly sensitized but otherwise untreated control animals showed specific reaction to antigen-dilutions between 1–1,000,000 and 1–250,000.

Farmer's experiment leaves no doubt that the increased tolerance to histamine which he induced in the sensitized guinea-pigs was accompanied by a quantitative nonspecific tolerance toward the specific anaphylactic reaction. These results permit another important conclusion, namely, that within limits the larger the quantity of antigen used in the specific stimulation of the sensitized tissue the greater the quantity of histamine released through the reaction. This conception, as we have seen (pp. 43), is helpful to the understanding of the phenomenon of the major and the minor food-allergens.

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L. Farmer[10] carried out a similar experiment but did not begin

[9] Karády, St. and Bentsáth, A.: *Ztschr f.d. ges exper. Med., 100:18*, 1936.
[10] Farmer, L.: *J. Immunol*, *36*.37, 1939.

influenced with administration of minimal quantities of histamine together with a corresponding diet.

Millet and Brown[3] treated angioneurotic edema with injections of histamine, obtaining favorable results in a few instances. Thirteen patients were so treated (two asthmatics). Eight had partial or complete relief. These writers report that the usual dose of 0.5 mg of histamine did not precipitate an asthmatic attack in the two subjects with asthma. All patients were kept in bed for one hour after each injection. One patient was given 1.0 mg of histamine three times daily, but obtained no relief of the allergic symptoms.

Ernstene and Banks[4] report the successful treatment with histamine of a case of severe generalized urticaria and constant intense pruritus of three weeks' duration. The first subcutaneous injection of 0.5 mg of histamine resulted in a complete disappearance of the pruritus within 20 minutes. The wheals were not appreciably affected. Eighteen hours later the pruritus recurred and a second injection of histamine then caused disappearance of the pruritus in 10 minutes and of the wheals in one-half hour. The experience was repeated several times. After five days (2 injections daily) the symptoms ceased and there was no return of them in 3 months.

Dzsinich[5] treated 15 cases of asthma and three cases of urticaria with 20 to 30 injections of histamine, the largest dose being 0.01 mg. Other details are lacking in the report. The author warns against larger doses, but offers no illustrative examples.

Thiberge[6] used typhoid vaccine in one group of 80 cases of bronchial asthma and a relatively high dosage of histamine (average 0.5 ml of a solution containing 1.0 mg/ml) in another group of 51 cases of gastrointestinal allergy, asthma or hay-fever. The injections were given twice a week. The author found both methods of treatment "useful in the treatment of allergic cases, be they skin, respiratory, bacterial, or digestive."

Alexander and Elliot[7] treated 14 cases of chronic urticaria with

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[3] Millet, R. F., and Brown, G. E.: *Med. Clin. North America*, 15:237, July 1931.
[4] Ernstene, A. C., and Banks, B. M.: *J.A.M.A.*, 100:328, 1933.
[5] Dzsinich, A.: *Klin. Wchnschr.*, 14:1612, 1935.
[6] Thiberge, N. F.: *J. Allergy*, 6:282, 1934–35.
[7] Alexander, H. L., and Elliot, R. W.: *J.A.M.A.*, 114:522, 1940.

CHAPTER XVIII

Histamine-Therapy

THE TREATMENT of allergic diseases, or, better, symptoms, with injections of histamine, in the form of its acid phosphate, has been undertaken on purely empirical grounds and from different points of view of the etiology of the conditions under treatment.

Ramirez and St. George,[1] who were the first to try this method of treatment, applied it in cases of asthma who exhibited negative cutaneous reactions to the usual inhalant and other excitants of that condition. They defined this group further as showing similar histories of digestive disturbance—irregular diarrheas, periodic constipation, nausea, headaches, vomiting, urticaria, etc. There were also "indicanuria and protein putrefaction in the freshly voided stool." The authors seem to have suspected histamine of intestinal putrefactive origin as the cause of the allergic symptoms in these cases. They also report that the patients exhibited "exceptionally large wheals (15 to 30 mm in diameter) on intracutaneous injection of their test-solution of histamine acid phosphate"; implying a supersensitivity to histamine.

The dosage of histamine ranged from one minim of a solution containing 0.5 mg/ml to six minims of a solution containing 2.0 mg/ml.

Two of the ten patients who received the injections "improved on the small doses but became worse with the larger dosage."

Friedlaender and Petow[2] treated subjects with migraine with histamine because they believed that condition to be due to histamine and other "shock poisons" derived from partial disturbance of the metabolism in the liver. They wrote:

> A large number of cases having the appearance of migraine show more or less clearly the symptoms of a disease of the biliary system and may be successfully

[1] Ramirez, M. A., and St. George, A. V: *Med. J. & Record, 119*·71, 1924.
[2] Friedlaender, W., and Petow, H.: *Med. Klin., 23*·1498, 1927.

influenced with administration of minimal quantities of histamine together with a corresponding diet.

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[3] Millet, R. F , and Brown, G E · *Med Clin. North America*, *15*:237, July 1931.
[4] Ernstene, A. C , and Banks, B M · *J.A.M.A* , *100* 328, 1933
[5] Dzsinich, A.· *Klin Wchnschr* , *14*·1612, 1935
[6] Thiberge, N F *J. Allergy*, *6*:282, 1934–35
[7] Alexander, H L , and Elliot, R. W : *J.A.M A.*, *114*:522, 1940.

intravenous injections of histamine. The full report of this study was not published, and in the abstract indicated by this reference there are no details of dosage, intervals, etc. However, these are found in a contribution of Dr. Alexander to Barr's *Modern Medical Therapy*, volume 1, p. 986. Alexander states that the initial dose was 0.1 mg of histamine given twice a day for five days, then once a day as the dose is "stepped up to 0.5 mg"; few patients with active symptoms can tolerate more than this. While the treatments met with success in urticaria, the results were not generally satisfactory in asthma. Of the 14 cases of chronic urticaria, 11 experienced prompt remission. Three of these relapsed, but more intravenous treatment again brought prompt relief. Subcutaneous injections were said not to be so effective.

Horton and his collaborators[8,9,10,11] have reported experiences with the treatment of headaches and Ménière's syndrome with histamine. In view of the demonstration, in the present study, of the food-allergic nature of all cases of headache and of dizziness who have completed the diagnostic dietary course, it seems proper to consider all the experiences of the Mayo group together. From the point of view of the phenomenon of the major and minor allergens and my experiences in the use of histamine in the nonspecific protection against the minor food-allergens (see Chap. XVIII), the most interesting result of the Mayo studies is the failure of the treatment in the large majority of cases of both categories, namely, 114 of the 184 cases of headache and 34 of the 49 cases of Ménière's syndrome. These failures seem to give support to the idea that the histamine-therapy is limited in its effectiveness to protection against the minor allergens and they suggest that the majority of food-allergic persons are subject to major food-allergy, in the new sense of this term.

Horton and his associates administer the relatively large dose of 1.0 mg of histamine in a large volume, 250 ml, of physiological saline solution intravenously. The injection is given slowly, by

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8 Horton, B. T., MacLean, A. R., and Craig, W. McK.: *Proc. Staff Meet., Mayo Clin.*, *14*:257–260, 1939.
9 Shelden, C. H., and Horton, B. T.: *Proc. Staff Meet., Mayo Clin.*, *15*:17–21, 1940.
10 Horton, B. T.: *Surg., Gynec. & Obst.*, *72*:417–420, 1941.
11 Horton, B. T., *J.A.M.A.*, *116*:377, 1941.

gravity, over a period of $1^1/_2$ hours. This treatment may be repeated on successive days.

When successful, the improvement is rapid and "Some patients seem to get along for months without additional treatment."

Farmer[12] reports having treated with histamine 105 persons, 60 of whom were suffering from asthma, vasomotor rhinitis, or both. He states that the results of this treatment have been very satisfactory in a "considerable percentage of the cases." Farmer, following Dzsinich, is using small doses—beginning with 0.0001 mg or less and advancing to a maximal dose of 0.05 to 0.2 mg, depending on the nature of the symptoms.

My own experiences with histamine-therapy in food-allergy began first with patient A. F. C. and next with patient C. T. The early course of the treatment in these two cases has been described in the discussion of the major and minor allergens; the following additional data concerning the treatment are of interest.

In both of these cases the subcutaneous injection of 0.1 mg of histamine at intervals greater than 24 hours has proved insufficient to protect against the small list of minor allergens that had been restored to their diet. On two occasions in the case of A. F. C. when, after a period of injections given at two-day intervals, allergic symptoms (nervousness, tiredness, neuralgia of left forearm, conjunctivitis) appeared, the subcutaneous injection of 0.1 mg of histamine always caused a sense of intracranial pressure approaching headache within 5 or 10 minutes. When the intervals between the injections were shortened to 24 or 12 hours, this effect ceased to be felt after the second injection. The absorption of histamine from the site of its subcutaneous injection seems, therefore, to be rapid and this suggests that it may be possible, through suitably repeated subcutaneous injections, to obtain the effect of a single slow intravenous injection of the same quantity of the substance.

In M. P., a child of 10 years, doses of 0.065, 0.07 and 0.075 mg all caused brief flushing, headache and general uneasiness when given at 2-day intervals. The dose was then dropped to 0.035 mg.

[12] Farmer, L.: *Bull. New York Acad. Med.*, 16:618–630, Oct., 1940.

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CHAPTER XIX

The Specific Mechanism of Idioblaptic Allergy

In the preceding edition of this monograph the discussion of this question was introduced with the remark, "Any consideration of the mechanism of idioblaptic allergy at this time must be speculative." The mystery remains; indeed we shall see that it has actually been deepened by the new light which the subsequent observations have thrown upon it.

In the extensive studies of the reaginic sensitivities of atopic allergy, the principle of the relative *independence of the atopic shock-organs* has been generally recognized. Thus, both bronchial asthma and coryza can be symptoms of a reaginic sensitivity to the same specific excitant; for example, an animal dander. Yet either of those symptoms may occur singly, or one may follow the other in the affected person at a considerable interval of time. Moreover, there are those "class A" hay-fever cases with high concentration of blood-borne reagin, who nevertheless suffer only *mild* symptoms of hay-fever.

Such examples tell us plainly that the limited localization of atopic symptoms needs more than the reaginic mechanism to explain it. The clinical reactivity of the atopic shock-organ is a function which develops ("matures") independently of the production of the peculiar allergic antibodies known as atopic reagins. And that maturing process does not necessarily go on *pari passu* in both the bronchial and the upper respiratory shock organs.

Let us now examine theory and fact concerning the specific mechanism of idioblapsis. The theory of von Pirquet and Schick postulates an antibody-antigen reaction, which irritates the susceptible tissues, and under the influence of the notable studies of Landsteiner and Chase that theory has had unquestioned ac-

After having reached that maximal dose, M. P. showed acceleration of the pulse (above her normal maximum of 72) after tests with beet, rice, grape, eggplant, cane-sugar, corn and wheat. The acceleration after eating wheat was less (80) than it had been at the beginning of the treatment (112).

From the foregoing survey of the still somewhat limited experiences in therapeutic use of histamine, the impression is gained that, excepting possibly the slow intravenous injection of relatively large doses, the optimal benefit of this treatment is obtainable through the subcutaneous injection at short intervals (2 to 10 times a day) of the easily tolerated maximal dose (0.035 to 0.1 mg or more). The dose must be adjusted to the tolerance of the individual of whatever age.

It is entirely practicable in most instances to instruct the patient or the patient's parent to give these injections.

If the above-discussed view of the mode of action of histamine therapy and the explanation of its limitation are accepted, the question naturally arises whether the more advantageous plan would be first to administer the histamine-therapy and afterwards to apply the dietary diagnosis to those patients who are not relieved by the injections.

Against this plan must be urged the following: Most of those who are benefited by the injections must, according to the above-mentioned theoretical considerations, be affected only by a small number of minor allergens; and most of these patients would prefer to avoid those few foods (or eat them only at intervals) rather than stand the inconvenience and expense of the daily injections for the rest of their lives.

The discerning reader of the foregoing discussions of the histamine-theory and our particular use of it will not have overlooked the narrowness of the experimental basis adduced in support of the general thesis. Some attempts have been made in the course of the discussion to indicate that its purpose was not to provide a demonstration but to suggest a working explanation of two striking phenomena of nonreaginic food-allergy; namely, that of the major and minor allergens and that of the weak but definite protection against the food-allergic reaction obtainable through histamine-therapy.

and her wheezing ceased. On Sept. 4 the first seven pulse-counts, taken at half-hour intervals, were 71, 76, 78 (cheese), 80, 88, 80, 76 (11:30 A.M.); then at 12:00 Noon there was sudden "palpitation" and the pulse-count was 110, followed at half-hour intervals by 92, 96 and 110.

These observations have no conceivable explanation in the terms of the antibody theory. On the contrary they point to an-

TABLE XXXI

Partial pulse-record of S N, showing marked antiallergic effect of stellate ganglion block (pulse-counts usually at 30 or 60 minute intervals). Some insignificant counts have been omitted

Two Days Before Block		Two Days During Block	
115	96	120	84
104	100	94	80 lamb
97	99	Block—1·30 P.M. 9/2	82—8.00 P.M. 9/3
97	104	82	84
94	95	88	88 asth.
102 inh.	94	88	80
102	95	88	72
99	104	84	80
100	102	81	80
100	105	83	78
97	99	84	71—9:00 A.M. 9/4
105	92	88	78 cheese
105	85	88	88
105	99	82	80
103 inh	98	76	76—11·30 A M.
		80	110—12 Noon: P.
		72	96
		76—10·A M. 9/3	110
		72	100
		78	104

All foods eaten in the period before the block were eaten also during the block. inh = vaporized medication; asth. = asthmatic symptoms; P = "palpitation"; normal pulse range = 72-84

other, unsuspected specific mechanism resident in the sympathetic nervous system.

All of these considerations permit two solid conclusions concerning the specific mechanism of idioblapsis; the first of which excludes the participation of specific antibodies as we know them, the other binds up idioblaptic sensitivity in an intimate and mysterious relationship with the sympathetic nervous system.

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97	104	82	84
94	95	88	88 asth.
102 mh.	94	88	80
102	95	88	72
99	104	84	80
100	102	81	80
100	105	83	78
97	99	84	71—9:00 A.M. 9/4
105	92	88	78 cheese
105	85	88	88
105	99	82	80
103 mh	98	76	76—11:30 A.M.
		80	110—12 Noon: P.
		72	96
		76—10 A.M. 9/3	110
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		78	104

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All of these considerations permit two solid conclusions concerning the specific mechanism of idioblapsis; the first of which excludes the participation of specific antibodies as we know them, the other binds up idioblaptic sensitivity in an intimate and mysterious relationship with the sympathetic nervous system.

To the writer the darkest aspect of the riddle is the apparent fact that in many subjects so many food-sensitivities are maintained by the mere intactness of the sympathetic chain; and that *the destruction of large portions of the chain has no greater antiallergic effect than the paralysis of a single ganglion.*

CHAPTER XX

*The Normal Human Adult Pulse**

It is a curious and, in a way, significant fact that as long and as constantly as the pulse-rate has been observed by physicians in their patients such data have seldom been made the major basis of diagnosis and treatment, regardless of the extent of variation of the rate from any accepted general norm. Evidently it was the frequency of the abnormal variations among persons who were looked upon as "normal" that prevented a diagnostic interpretation of them. And if these "normal" persons complained of other common variations from an agreeable state of health, such as recurring headaches, indigestion, constipation, tiredness and nervousness, those conditions were viewed as part of some defect in character or psyche which could and *should* be controlled by concentrated will-power. Here also the frequency of such symptoms among the population prevented the medical profession from looking upon them as reflecting physical abnormality.

Another fundamental difficulty in the way of the interpretation of wide variations of the pulse-rate lay in the false general concept of the *normal* pulse-rate.

This concept had to be drawn from the average of practically single pulse-counts made in large numbers of supposedly normal persons. Seventy-two beats per minute has been looked upon as the average normal rate, although Peterson and Walter,[1] in 2,500 observations on 1,200 subjects, have laid down 66 beats per minute as normal for men and 74 for women.

In the course of the study of familial nonreaginic food-allergy, it has been observed that every food-allergic person under the influence of the allergen exhibits an acceleration of the pulse-rate.

* A large part of the material composing this chapter has been taken from an article on the same subject published by the author in the *Annals of Allergy*, November–December issue, 1943

[1] Peterson and Walter: *J.A.M.A.*, 78:341, 1922.

To the writer the darkest aspect of the riddle is the apparent fact that in many subjects so many food-sensitivities are maintained by the mere intactness of the sympathetic chain; and that *the destruction of large portions of the chain has no greater antiallergic effect than the paralysis of a single ganglion.*

down at each meal, and at three half-hour intervals after each meal), with the results as are shown in the accompanying tabulation.

Individual	Lowest Count	Highest Count	Range
1	62	72	10
2	62	72	10
3	66	76	10
4	69	76	7
5	70	78	8
6	72	80	8
7	72	82	10

The outstanding character of the normal pulse-rate in this record of the seven normal (nonallergic) persons is the narrow range of the pulse-rate from the low to the high point in each individual.

(B) This group is composed of 104 food-allergic persons who had exhibited a variety of symptoms, most frequent among which were headache (including migraine), canker-sores, indigestion, chronic urticaria, physical tiredness, nervousness, neuralgia, constipation, chronic rhinitis (sinusitis) and dizziness, and in whom the symptoms had disappeared after elimination of the *materia peccans* from the diet or environment. Those data concerning these patients which are pertinent to this inquiry are assembled in Table XXXII.

For the appreciation of the significance of the respective normal pulse-rates, it is important to remember that these rates are drawn from observations of individuals extending over periods of weeks or months or, in some cases, even years. During the period of dietary treatment and for some time thereafter in most cases, the pulse-counts were made 14 to 22 times daily—in most instances by the patient. No extraordinary precautions were prescribed as to posture or to *usual* activity.

A comparison of the pulse-records of the nonallergic group A and those of the allergic group B, after avoidance of all allergic excitants shows them to be essentially similar. Both show the variations of the normal rate in different individuals, which is discussed below, and the "even and low level" and narrow range mentioned above.

With the use of this new means of diagnosis, all of the excitants of food-allergy in each case can usually be identified; and shortly after these allergens have been avoided, the pulse-rate in the allergic individual has been seen to fall to an even and low level and to remain there constantly. This observation suggested the possibility that a group of such successfully treated persons could serve as favorable material for the study of the normal pulse-rate. Evidently a similarly favorable group was to be found in persons who are naturally free from pulse-accelerating allergy. From a study of these two groups of persons, one should derive information as to the extent of the normal variations of the pulse-rate in the same individual and also as to the possible variations of pulse-range in different normal persons.

The data on which this study has been made differ, as far as we can ascertain, from those previously published in the fact that they are the result, not of a few observations on each individual, but of observations made on each person many times throughout each day over periods of weeks or months. Through such extended study of the individual pulse-rate could be determined, with reasonable certainty, the degree of its variation that could be considered to be within normal limits, high and low. In this way a normal base-line could be established from which abnormal variations can be judged.

The present discussion, then, concerns itself (A) with a group of persons free from food-allergy, and (B) with a group of food-allergic persons after presumable elimination of all the incriminated allergens from their environment or diet.

(A) The group of available persons who are primarily free from pulse-accelerating allergy has been small. There has been little opportunity to observe, for an extended period of time, the variations of the pulse-rate in persons who could be presumed to be free from food-allergy by reason of absence of symptoms and of a bilaterally negative family history with respect to the 10 common symptoms listed under B.

Out of an unselected group of 42 individuals, only seven such persons were found, all young pupil-nurses at the hospital in Hackensack, New Jersey. These have recorded the pulse-rate 14 times in each of two days (on rising, and on retiring; on sitting

Table XXXII (*Continued*)

Patient	Sex	Age	Range of Pulse-Rate: After Treatment	Range of Pulse-Rate: Before End of Treatment
J. M.	M	40	66–72	62–100
M M	F	38	56–68	56–120
Mrs H N	F	43	76–84	76–110
A L K.	M	54	68–74	62–94
Mrs G	F	49	72–80	63–88
A. M.	M	40	60–68	68–92
E E	F	32	58–70	56–89
H B.	F	49	60–72	59–100
Mrs W.	F	40	60–72	60–108
H W.	M	16	58–68	58–84
P B	F	28	64–76	66–88
D B.	F	30	56–70	64–112
A. G.	F	23	72–84	72–108
Mrs N	F	67	60–70	60–78
G McC.	F	24	64–74	68–91
D L.	F	39	64–78	67–97
S. L.	M	46	68–82	67–108
R. P.	M	60	50–60	51–79
F. K.	M	68	64–70	64–96
J M	M	44	66–80	64–121
A. S.	M	32	68–70	68–78
E. C.	F	over 50	63–72	—
H P.	M	42	56–68	55–93
R. R.	M	21	50–60	62–85
M A	F	18	63–78	60–98
J B.	M	45	70–78	70–100
R B	M	45	60–70	58–106
D B	F	38	66–78	70–105
A B	M	57	68–80	68–88
Miss P	F	40+	72–78	72–102
R. S.	F	22	46–59	58–88
E. H.	F	46	72–84	—104
Mrs J	F	33	62–74	64–98
L. P.	M	61	50–63	54–108
E C	M	54	69–81	67–119
C G	F	15	52–61	56–88
L R.	M	40	70–76	70–94
W R.	M	24	56–70	60–88
M G	F	26	66–76	66–90
A C M	F	50	66–80	62–96
F C C.	M	40+	56–66	56–116
Mr L.	M	43	74–84	80–112
M C	F	19	61–71	70–100
M. L.	F	26	66–78	66–96
G A.	F	28	62–68	64–94
M W.	F	46	65–74	62–99
L. A. C	M	70	56–66	56–84
G. M D	M	65	68–74	58–94
M S.	M	36	60–72	56–88
A. K.	F	51	70–74	62–88
M. G. H.	M	55	60–68	56–88
J W. J.	M	40	60–64	62–110
L. K. O.	F	28	56–68	58–100

Table XXXII

Range of the pulse-rate in 104 food-allergic persons before and after dietary treatment

Patient	Sex	Age	Range of Pulse-Rate	
			After Treatment	Before End of Treatment
E. F. C.	F	19	68-80	to 180
A. F. C.	M	65	58-70	66-100
M. M. D.	F	27	70-80	70-100
A. R.	M	23	70-84	66-108
C. T.	F	26	72-78	65-112
J. G.	M	36	66-80	66-100
H. E.*	F	49	58-76	76-106
W. W. F.	M	57	56-68	66-100
M. W. F.	F	52	58-72	72-100
A. W. F.	F	17	60-72	70-90
F. C. F.	M	16	58-70	58-84
M. B.	M	22	64-76	64-100
P. W.	F	47	62-78	68-100
R. M.	F	22	62-78	68-100
A. P.	F	70+	70-74	72-100
S. I. H.	M	40	68-80	65-108
H. A. S.	M	58	60-74	60-105
J. F.	F	53	68-80	68-108
W. S. C.*	M	41	40-62	46-70
J. V.*	F	35	48-64	44-78
E. B.	F	50	72-76	82-108
Dr. R.	M	26	70-76	70-90
R. F.	M	31	62-76	64-114
A. F.	M	10	74-78	82-124
N. V. W.	F	38	62-76	64-86
Dr. I. P.*	M	16	72-78	84-104
L. H. B.	F	20	58-70	60-90
J. J. V.	M	38	62-74	70-94
C. B.	F	23	67-72	72-100
K. S.	F	48	70-80	70-110
M. D. B.	F	50+	52-60	62-90
G. H.	F	17	54-66	66-102
E. K.	F	27	58-66	60-96
A. S.	F	50	62-76	66-96
J. K.	M	30	60-62	78-102
G. D.	F	55	64-74	64-92
J. B.	M	35	68-78	68-100
O. W. L.	M	52	68-80	70-98
Mrs. E. B.	F	36	48-60	47-79
M. P.	F	11	60-72	74-116
M. S.	F	31	64-74	64-100
W. G.	F	21	66-78	66-86
L. S.	M	24	56-68	56-88
B. B.	M	20	58-68	58-78
T. C. F.	M	50	54-68	54-90
E. H.	M	50	60-68	66-88
C. A. E.	M	50	60-68	66-90
E. A.	F	63	56-68	75-100
A. C. M.	F	50	64-78	62-100
G. C. N.	M	55	70-78	74-88
C. W.	F	19	57-69	62-114

* These patients did not complete the dietary diagnosis and undoubtedly are mildly affected by unidentified minor allergens, although completely relieved of their major symptoms.

TABLE XXXII (*Continued*)

Patient	Sex	Age	Range of Pulse-Rate: After Treatment	Range of Pulse-Rate: Before End of Treatment
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F C C	M	40+	56-66	56-116
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M. L.	F	28	66-78	66-96
G A	F	28	62-68	64-94
M W.	F	46	65-74	62-99
L. A C	M	70	56-66	56-84
G M D	M	65	68-74	58-94
M. S	M	36	60-72	56-88
A K	F	51	70-74	62-88
M G H	M	55	60-68	66-88
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M. M. D.	F	27	70-80	70-100
A. R.	M	23	70-84	66-108
C. T.	F	26	72-78	65-112
J. G.	M	36	66-80	66-100
H. E.*	F	49	58-76	76-106
W. W. F.	M	57	56-68	66-100
M. W. F.	F	52	58-72	72-100
A. W. F.	F	17	60-72	70-90
F. C. F.	M	16	58-70	58-84
M. B.	M	22	64-76	64-100
P. W	F	17	62-78	68-100
R. M	F	22	62-78	68-100
A. P.	F	70+	70-74	72-100
S I H.	M	40	68-80	68-108
H. A. S.	M	58	60-74	60-105
J. F.	F	53	68-80	68-108
W S. C.*	M	41	40-62	46-70
J. V.*	F	35	48-64	44-78
E. B	F	50	72-76	82-108
Dr. R	M	26	70-76	70-90
R. F.	M	34	62-76	64-114
A. F.	M	10	74-78	82-124
N. V. W.	F	38	62-76	64-86
Dr. I. P.*	M	46	72-78	84-104
L. H. B.	F	20	58-70	60-90
J J. V.	M	38	62-74	70-94
C. B.	F	23	67-72	72-100
K. S.	F	48	70-80	70-110
M. D. B.	F	50+	52-60	62-90
G. H.	F	17	54-66	66-102
E. K.	F	27	58-66	60-96
A. S.	F	50	62-76	66-96
J. K.	M	30	60-62	78-102
G. B.	F	55	64-74	64-92
J. B.	M	35	68-78	68-100
O. W. L.	M	52	68-80	70-98
Mrs. E. B.	F	36	48-60	47-79
M. P.	F	11	60-72	74-116
M. S.	F	31	64-74	64-100
W. G.	F	21	66-78	66-86
L. S.	M	24	56-68	56-88
B. B.	M	20	58-68	58-78
T. C. F	M	50	54-68	54-90
E. H.	M	50	60-68	66-88
C. A. E.	M	50	60-68	66-90
E. A.	F	63	56-68	75-100
A. C. M.	F	50	64-78	62-100
G. C. N.	M	55	70-78	74-88
C. W.	F	19	57-69	62-114

* These patients did not complete the dietary diagnosis and undoubtedly are mildly affected by unidentified minor allergens, although completely relieved of their major symptoms.

nonallergic—pulse-rate must be judged with respect to its maximum and also its range. Both of these characters have been found to vary greatly, in the nonallergic state, in different persons. Hence, no fixed pulse-rate can be laid down as normal.

The present study reveals, in most persons not under the influence of food-allergy, a daily range of the pulse-rate which reaches a maximum of about 16 and a minimum of two beats or possibly less in a few persons. An interesting source of information on this point is the records of the pulse-rate in the food-allergic persons who, through the method described in Chapter II, have identified and thereafter avoided all of the foods to which they were sensitive. Thus, among the 104 cases in Table XXXII *the nonallergic range of the pulse-rate* showed the following variations:

Range (Low to High) Beats per Minute	Number of Individuals
18? (unfinished)	1
16	4
14	16
12	36
10	16
9	3
8	10
6	10
5	1
4	5
2	2

A maximal pulse-rate of 86 or more in an adult has been *found to occur, as a rule, only in food-allergic persons.* Dr. Charlotte Munn has observed one apparent exception to this rule; E. C., with negative personal history, positive unilateral family history of food-allergy (headaches in the mother and one sib), and a pulse-rate ranging, over five days, from 88 to 96. *The cause of this continued tachycardia has not been discovered.*

In practice, these exceptional instances must be only rarely confusing, because in almost all cases needing medical treatment with the method described in Chapter 2 there must be symptomatic evidence of food-allergic disease with which the course of the pulse-rate will be nearly always in diagnostic agreement.

Several interesting characters of the normal pulse-rate are revealed in these data. The first of these, just referred to, is the wide variation of the normal rate in different individuals. Thus the normal range of the pulse in patient A. R. is 70 to 84, whereas that in patient Mrs. E. B. is 44 to 60. The maximal rate in 21 of these patients was found to be lower than the minimal rate in 11 others.

Pulse-rates of 44 per minute and less have been previously observed in persons of perfect health and high physical capacity. Dr. George C. Deaver of New York University found rates of 47, 42 and 38, respectively, in the well-known runners Paavo Nurmi, Glenn Cunningham and Leslie MacMitchell. While these low rates are somewhat unusual (there are only three persons in our series of 62 treated cases showing low rates below 50), there is no apparent reason to consider them pathological.

The second noteworthy point in the data in Table XXXII is seen in a comparison of the average pulse-rates in the two sexes. It has been generally supposed that the heart-beat in women averages somewhat faster than that among men.

The wide variations in the pulse-rate in different normal individuals and the considerable range of those rates in some make it seem of minor interest to calculate a general average rate in either sex. A more reasonable basis of comparison would seem to be the average maximal rate and the average minimal rate in the two groups. When these values were computed from the data presented in Table XXXII, it was seen that the corresponding averages were only slightly different in the two sexes. Thus the average minimal rates in the 48 men and the 56 women were, in the men 62.3, in the women 62.4; while the average maximal rates were, in the men 72, in the women 72.7.

Every physician is acquainted with cases of abnormally high pulse-rate, where careful examination fails to detect signs of organic heart disease or endocrinal disturbance. In such cases the physician has to content himself with such a diagnosis as "nervous heart." It will appear from the data presented here that cases of this type will merit scrutiny for possible identification of this symptom as food-allergic.

From the standpoint of the present discussion, the normal—

nonallergic—pulse-rate must be judged with respect to its maximum and also its range. Both of these characters have been found to vary greatly, in the nonallergic state, in different persons. Hence, no fixed pulse-rate can be laid down as normal.

The present study reveals, in most persons not under the influence of food-allergy, a daily range of the pulse-rate which reaches a maximum of about 16 and a minimum of two beats or possibly less in a few persons. An interesting source of information on this point is the records of the pulse-rate in the food-allergic persons who, through the method described in Chapter II, have identified and thereafter avoided all of the foods to which they were sensitive. Thus, among the 104 cases in Table XXXII the nonallergic range of the pulse-rate showed the following variations:

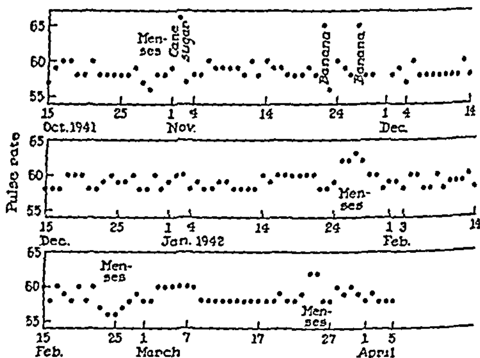
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8	10
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A maximal pulse-rate of 86 or more in an adult has been found to occur, as a rule, only in food-allergic persons. Dr. Charlotte Munn has observed one apparent exception to this rule; E. C., with negative personal history, positive unilateral family history of food-allergy (headaches in the mother and one sib), and a pulse-rate ranging, over five days, from 88 to 96. The cause of this continued tachycardia has not been discovered.

In practice, these exceptional instances must be only rarely confusing, because in almost all cases needing medical treatment with the method described in Chapter 2 there must be symptomatic evidence of food-allergic disease with which the course of the pulse-rate will be nearly always in diagnostic agreement.

A comparison of the summarized pulse-records of the food-allergic patients before and after the completion of the dietary course and elimination of all allergens from diet and environment shows, in all of them, a narrowing of the pulse-range with a lowering and a remarkable stabilization of the daily maximal rate. In all patients who have successfully completed the course, the

CHART XV



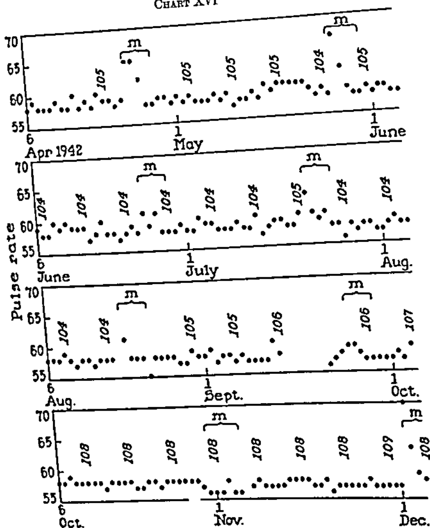
Showing the daily maximal pulse-rate (each dot indicates the maximum for the respective day) in Mrs. E. B. from October 15, 1941, to April 5, 1942.

maximal rate reached each day has not varied, under normal conditions, more than two points from day to day.

A unique record illustrating this fact is that of Mrs. E. B., who each day since the conclusion of her dietary treatment, October 15, 1941, has made and recorded her pulse-counts (14 counts daily). In this entire period (six months less ten days) her daily maximal rate varied from 58 to 60 (Chart 15), with the following exceptions.

It is seen that on two of the occasions, November 2 and 22,

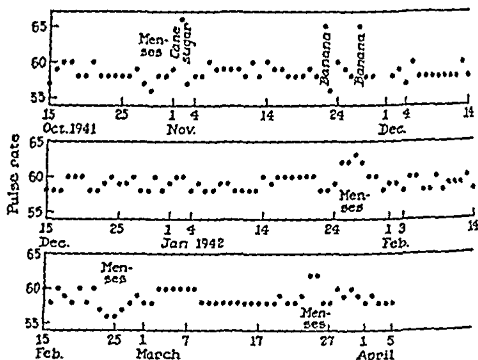
CHART XVI



The daily maximal pulse-rate (each dot indicates the maximum for the respective day) in Mrs. E B from April 6, 1942, to December 5, 1942. m = menstrual period, figures 104–109 = body weight. Spaces where dots are missing indicate that pulse-rates were not recorded on those days.

A comparison of the summarized pulse-records of the food-allergic patients before and after the completion of the dietary course and elimination of all allergens from diet and environment shows, in all of them, a narrowing of the pulse-range with a lowering and a remarkable stabilization of the daily maximal rate. In all patients who have successfully completed the course, the

CHART XV



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It is seen that on two of the occasions, November 2 and 22,

any of the 47 patients who have successfully completed the course of treatment shown any perceptible effect of a high-protein meal *per se* on the pulse-rate.

Patient Mrs. E. B. continued recording the daily 14 counts, with few interruptions, throughout another eight months, always avoiding allergenic foods and remaining completely free of food-allergic symptoms. The daily maxima in that period are shown in Chart XVI. The characters of the nonallergic pulse seen in the first period appear in the second. There are the accelerating and the slowing (October 31 to November 6) effects of the menstrual period. There is also the stability, but at a slightly lower level after July. Previously the maxima had lain regularly between 58 and 60, but they gradually sank to a regular variation between 57 and 58 with only an occasional 56 or 59. At this time the body-weight increased several pounds and the patient reported that she was feeling particularly well.

The second pulse-record of Mrs. E. B., like her first, contains internal evidence, in its consistency, of the dependability of her pulse-counts. Some critics have raised this latter question in fundamental objection to the whole diagnostic method. One of these would refuse to consider any such data that had not been obtained from electrocardiograms!

Evidently the practical application of the diagnostic method described elsewhere is ordinarily possible only if the patient can be taught to count the pulse. Of course, there are exceptions, as in the very ill, who are under constant medical attention, or in young children. However, it is uncommon to encounter persons who cannot qualify in this respect.

The pulse-rate of the child under the age of puberty is reputed to be relatively rapid. This impression, of course, has been acquired without consideration of a possible food-allergic constitution in the subjects.

In a small survey carried out in the High School at Pearl River, opportunity was afforded to make a casual examination of the pulse-rate in 115 children about one hour after the midday meal.

Two groups were selected; 65 past the age of puberty and 50 well beneath that period. The children had been seated and at work for more than 10 minutes after midday recess and had been

when the patient ate allergenic foods—cane-sugar and banana—that caused acceleration of the pulse, the maximal pulse-rate on the following day was found to be slightly below the normal limit; while on the third occasion, November 27, no such drop occurred. The submaximal high-count of 57 on October 15 followed a supermaximal 62 on the previous day. The slight acceleration during the January menses and on two days of the March menses, and the slight depression of the rate in the October and the February menses remain unexplained. A similar phenomenon is reported by patient E. K. At every menstrual period she experiences a greatly accelerated pulse-rate accompanied with migraine. These menstrual abnormalities of the pulse-rate were not observed in the November or December periods in patient Mrs. E. B. The only other deviation of the daily maximal rate from the limits 58 to 60 occurred on December 4, with a high count of 57. This exception was unexplained.

In estimating the stability of the maximal pulse-rate in Mrs. E. B., one must take into account the possible error in the counts by a previously untrained person. This error was minimized by the patient's practice, shown in the odd figures, of counting the pulse for a whole minute. If allowance is made for an error of one beat per minute, plus or minus, one must conclude that the daily maximal normal pulse-rate in this patient throughout the period of observation was possibly within a half-beat, plus or minus, of 59 beats per minute.

It is worth pointing out that in that period the patient, being entirely free from her allergic symptoms, was leading the active life of a housewife and did not take any extraordinary precautions when counting the pulse, excepting that the counts were always made with conscientious care.

In passing, another point may be worth mentioning. A high medical authority, in commenting upon these results, has made the objection, out of common knowledge, that "a meal containing a liberal portion of meat causes a 25 per cent acceleration of the pulse." However, this patient, like some other successfully treated cases, being deprived of cereals and potato, consumes, perhaps more than the usual quantities of meat and egg, yet without at any time exhibiting the phenomenon just mentioned. Nor has

allergy is the recognition of a "pulse-character" which seems to be as individual as the other characters, such as the finger-print.

The pulse-character is defined by its general (average) level, its range (lowest to highest rate) and the constancy of its *daily* maximum. Normal rates as low as 38 and as high as 84 (but no higher) have been observed; and normal ranges varying between 2 and 16.

The maximal rate, for the individual who is free from food-allergy, is reached at least once each day; and this phenomenon, when it is observed, is the most reliable objective sign of a successful completion of the pulse-dietary survey. The daily maximum in some is a constant number, while in others it varies one or at most two beats per minute.

The normal pulse in many persons is not affected by the digestive process. In some the pulse remains quite constant throughout the digestive period ($1^1/_2$ to 2 hrs); in others it may reach its daily maximum after a light meal and may even slow down perceptibly after a heavier one that includes meat. To repeat, the normal human pulse is unaffected by ordinary physical activity or by the digestive process.

informed of the object of the test. The taking of the pulse-counts of the older group was directed by Mr. S. I. Hicks, superintendent of the school; that of the younger children was in charge of the school nurse. Hence, there was no cause for fear or nervousness among the pupils, nor was any apparent. The results of the survey are shown in Table XXXIII.

The relative rapidity of the child-pulse is seen in the fact that only 4 per cent of the younger group showed a pulse-rate of 76 as compared with the 33 per cent of the older pupils showing 76 or lower.

TABLE XXXIII

The pulse-rate in school children one hour after lunch

65 pupils; age 14–17	50 pupils; age 8–10
No *Pulse-rate*	*No.* *Pulse-rate*
12 = 72 or lower = 18%	
21 = 76 or lower = 33%	2 = 76 or lower = 4%
31 = 90 or more = 48%	25 = 90 or more = 50%
12 = 100 or more = 18+ %	10 = 100 or more = 20%
20% between 76 and 90	46% between 76 and 90
11% between 80 and 90	38% between 80 and 90
6% between 82 and 90	30% between 82 and 90

Lack of sufficient data prevents comment on the constancy in the two groups of about 50 per cent showing rates of 90 or more, and the seeming corollary that the large increase, in the older group, of those showing rates of 76 or less was drawn almost entirely from the group among the younger children showing rates between 76 and 90.

The average pulse rate of the *normal* child (before puberty) is, then, higher than that of the adult (after puberty), yet the maximal rate of the normal child seems to be the same as that of the normal adult—no normal pulse-rate over 84 has been observed in the child of three years or older. Further study of this point is indicated.

CONCLUDING REMARKS

The rate of the normal adult human pulse is not fixed. Indeed, the outstanding physiological product of the study of idioblaptic

TABLE XXXIV

Summary of the pulse-rate observed over five days in 50 subjects of dementia praecox at Rockland State Hospital by Dr. Charlotte Munn

Patient	High	Low	Range
E. A.	104	60	44
R. B.	100	58	42
G. B	100	70	30
E. C.	103	61	42
M F.	96	54	42
I. F.	80	56	24
E. R.	106	66	40
M K.	120	60	60
C. K.	92	64	28
A. L.	89	60	29
C. E.	90	66	24
A. S.	90	60	30
M. M.	90	58	32
M. F.	104	70	34
D. M.	100	70	30
M C.	104	60	44
H. S.	100	64	36
B. S.	88	58	30
I. R.	90	54	36
A. R.	104	59	45
A. A.	118	62	56
R. L.	112	72	40
C. P.	94	56	38
E S.	108	62	46
M. W.	116	64	52
A. W	122	64	58
E. I.	112	60	52
E R.	106	66	40
E. B	102	52	50
L. M.	112	70	42
E. B	96	64	32
L. H.	104	64	40
M. M.	92	52	40
E. M.	86	52	34
A. P.	91	59	32
G W	95	65	30
M E.	90	60	30
R. L.	102	68	34
H. P.	100	60	31
J W	100	60	40
L. R.	92	61	31
L. J.	110	57	53
R. L.	105	62	43
C. O	116	64	52
E. B	115	64	51
J S	100	62	38
M L.	90	54	36
T S	99	62	37
M. O'C	84	58	26
M. G.	85	60	25

CHAPTER XXI

The Statistical Method in the Study of the Effects of Idioblaptic Allergy

THREE MODES OF applying the statistical method in the study of idioblaptic disease have been successfully used. It happens that all of them were employed in identifying idioblaptic allergy as probably the most important, if not the only, *predisposing* cause of a "low-grade" (Locke) infection. Thus the statistical method was used:

1. In the study of common cold by the *exclusive* criterion (Coca).
2. In the study of common cold by *number* of allergic symptoms (Locke).
3. In the study of poliomyelitis by *symptomatic type* (Locke).

Exclusive Criterion

The writer's use of this criterion[1] is set forth in Chapter XVIII. All persons free from idioblaptic allergy were found resistant to common cold. Persons with mild or controlled allergy were also cold-resistant.

Number of Allergic Symptoms

Locke[2] and his associates reported that individuals with many idioblaptic symptoms suffer on the average more colds than do persons with few symptoms.

Symptomatic Type

Studying the data obtained by questioning victims of poliomyelitic paralysis and high-school student controls, Locke[3] noticed that whereas the incidence of some allergic symptoms was the same in the two groups, seven other symptoms affected the

sensitivity, for a considerable percentage of *nonpsychotic* persons have an equally high degree of sensitivity. As in all the proved accessory symptoms of idioblaptic allergy the determining factor here must be sought in the specific (hereditary?) localization of the "shock" area.

In all cases the pulse-rate was recorded through at least five days and at least 14 times daily. The psychotic patients in the two institutions were well cared for and were quiet at the observations which were made by a familiar attendant.

The thought that the major psychoses may have an allergic basis has already been entertained by some writers. Discussions of this possibility are found in articles by T. Wood Clarke[4] and especially by N. W. Winkelman and Matthew T. Moore.[5]

References

1. Coca, A. F.: *J. Lab. & Clin. Med., 26:*757, Feb. 1941.
2. Brown, Graham, Niedringhaus and Locke: *J. Immunol., 46:*101, 1943.
3. Locke, A. P. and Coca, A. F: *Ann Allergy*, 1950.
4. Clarke, T. Wood: *Psychiatric Quarterly, 14:*800, Oct. 1940.
5. Winkelman and Moore: *J. Nerv & Ment. Dis., 93.*736, 1941.

polio group much more frequently than they did the controls (see page 155).

A Fourth Criterion

Restudying the data obtained from a total of 80 psychotic (dementia praecox) subjects I have come upon a fourth criterion with which the influence of idioblaptic allergy may be statistically observed in this condition. This mode may be named the criterion of quantitative pulse-reaction.

The data from 50 of these cases of psychosis are presented in Table XXXIV. Those from 30 cases examined in another institution by an independent observer are similar in the essential features.

TABLE XXXV

Presenting statistical evidence of the greater degree of allergic sensitivity among subjects of dementia praecox as compared with allergic but presumably nonpsychotic patients

Pulse-Rates	Dementia Praecox 80 Cases Per Cent	*Allergic Patients* (Table XXXII) 104 *Cases* Per Cent
Maximum 100 or more	62 0	50 0
Maximum 112 or more	22 0	11 6
Range 40 or more	42 0	20 0
Range less than 24	0 0	13.6
Range 30 or less	26 0	46.6
Minimum 70 or less	86 0	83 0

In Table XXXV are compared the 80 combined cases of psychosis and the 104 nonpsychotic cases of various other allergic manifestations, with respect to the general degree of allergic sensitivity as judged by the pulse-rate.

It is seen that while the average minimal pulse-rate is approximately the same in the two groups the average maximal rate and the average range of the pulse (lowest to highest counts) are both much greater among the psychotic individuals.

This statistical evidence reveals a distinct tendency among psychotic subjects to a greater degree of allergic sensitivity, thus indicating an allergic influence in psychosis. But dementia praecox cannot be due *only* to this *greater degree* of the constitutional

families 1 and 31 (only one observation one hour after eating in each case).

In nine families (Table XXXVIB) food-allergy is absent in five (1, 3, 5, 6, 9) and questionably present in four (2, 4, 7, 8).

The two children in family 18 had exhibited no clinical symptoms of food-allergy, although 18b showed an undoubtedly food-allergic pulse-rate of 108. A similar situation is seen in family 28 with a most probably bilaterally food-allergic parentage of the four sibs The pulse-rates of 98 and 92 speak for food-allergy in 28b and 28c.

The pulse-rates were observed by several examiners at about one hour after the midday meal. Most of the pupils were seated during the count; a few of the boys were standing. While it is true that the maximal pulse-rate in the food-allergic person cannot be determined through a single observation, the results of these examinations are sufficient for the present purpose, since they reveal a decidedly higher average pulse-rate among the food-allergic group than that in the "negative" group. A more extensive study in this direction was not practicable.

Incidentally, it may be pointed out that the inheritance of atopy (hay-fever, asthma) is not so favorably exhibited in the available surveys. That of Spain and Cooke serves well for comparison. Thus, among 211 families in which the inheritance was considered by these writers to be "unilateral," atopy was not found in either parent in 75—more than one-third. Among 32 families in which the inheritance was considered to be "bilateral," reaginic atopy was not found in either parent in 10 and it affected only one parent in seven other families.

The following symptoms of food-allergy have been given in the questionnaire regarding the food-allergic clinical history: hives, headaches, heartburn, indigestion,* canker-sores, dizziness, diarrhea or constipation, nervousness, neuralgia, physical tiredness.

Since it was easy to distinguish hives due to physical causes, usually cold, and to external causes, this symptom was deemed sufficient, by itself, to indicate a food-allergy. Canker-sores and headaches are also considered significant by themselves. Heart-

* Indigestion covers nausea, vomiting, belching, gastric discomfort, or pain.

CHAPTER XXII

Inheritance of Idioblaptic Allergy

THE INQUIRY of some previous writers into this question has been limited to a single symptom such as migraine or urticaria. Thus Vaughan reports that 29 of his series of 63 cases presented "a family allergic history or a family history of migraine." Vaughan (*Practice of Allergy*) has also collected the reports of Rowe, Bray, Balyeat and his own concerning the incidence of allergic disease in the families of the subjects of migraine. This incidence was found to be, respectively, 74, 82, 85.4 and 85 per cent. However, a survey of the Borough of Oradell, New Jersey, with respect to the occurrence of nonreaginic food-allergy, which has been conducted at the instance and under the auspices of the Board of Health of Oradell, shows that a study of the inheritance of this disease may not be limited to a single clinical form of it, but must include all of its most common manifestations.

When this is done, even to a degree that falls somewhat short of perfection—that is, without examination of the pulse-rates in both parents—the positive family-history has been obtained in all food-allergic persons whose parents were accessible to personal questioning. Moreover, it was not necessary, for this purpose, to carry the inquiry beyond the two parents of the individual.

Thus, among the 40 families thus far included in the Oradell survey, there are 25 in which one or more of the children exhibited clinical symptoms of food-allergy (Table XXXVIA, families 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 22, 23, 24, 25, 26, 27, 29, 30). In all of these families one or both parents exhibited food-allergic symptoms. In the six families in which one or both parents are food-allergic, but in which none of the children exhibited any food-allergic symptom, a food-allergic pulse-rate of 90 or more was observed in one or more of the children excepting

TABLE XXXVIb

			Pupil											Father											Mother											
	Age	Pulse-Rate	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Remarks
N 1	11	68				?																								x			Almost no colds in family M. eczema due to tomato, orange, chocolate
N 2	7	80								x																							
N 3a	12	82																															
N 3b	13	80																												x		x	Sister age 8 n^eg. Parents ha occasional slight cold
N 4	12	84																															
N 5	12	64																															
N 6	14	78																															M. 2 colds yearly
N 7	14	78													x	?																	
N 8	11	74								x										x											t		F. 6 albs neg; M. 7 albs neg
N 9	8	80																															

t = "from abscessed teeth."

Table XXXVIa

			Pupil										Father										Mother										
	Age	Pulse-Rate	Hives	Headache	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea or Constipation	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headache	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea or Constipation	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headache	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea or Constipation	Nervousness	Neuralgia	Phys. Tiredness	Remarks
1	11	88								x				e?			x	?			x	x								x			Boy has had mastoid operation.
2	8	92								x			x											x		x		x		x	x	x	Sibs aged 9 and 11 P = 93 and 118
3	9	96		x			x													x					x	x	x						
4a	12	90								?		x		x						x	x												
4b	13	88		oc										x						x	x												
5	14	104							con col					x		x				x		x		oc		x	x			x			
6	11	96					x								x	x				x		oc		x	x	x		x		x	oc	x	
7	11	120						x		x	x	x								x				x		x	x						Hay-fever
8	11	96																		x				x		x			con	x		x	Mother—arthritis
9	15	84		x			x	x						oc		x			oc		rh			x	x	x	x					x	
10	8	108				x	x			x				x		x			x	x	x	x			x	x	x			x		x	Sister: hives, headaches, etc.
11	11	120	x							x				x		x	x			x		x		x		x				x		x	Father: asthma
12	12	84								x										x				x				x		x		x	Brother: hives
13	13	84	x				x			x		x		xx		xx				x		x	x		x		x			xx		xx	Has hay-fever and asthma
14	15	88		x																x		xx								x		x	Mother's pulse-range 75–94
15a	13	60 lr								x				x		x				x		xx											
15b	14	68		x		x				x		x		x		x				x		xx											
16a	10	100	xx	x			x			x													x			x	x			x		x	
16b	8	100		x			x	x		x													x			x	x			x		x	
17	10	104										x										x		x									
18a	10	84														x							x	x			x						
18b	13	108														x							x	x			x						
19	8			x			xx	?		xx				x						x		xx						x			x	x	Sister: canker-sores, tiredness
20	10	104				x				x		x		xx					x	x		x								x		x	Hay-fever
21	9	98												oc		x				x		x											Hay-fever (student and father). Father pulse rate 50–72
22		112								xx		x				x											x			x	x	x	Brother: headaches, canker-sores
23	6		x							x				x			x							xx							x	x	Hay-fever
24	10	90		x		x	x					x		x				x							x	x		x		x	x	x	Pat. G. dizziness
25	14	98	x				?						x		x	x								x						x			
26	13	94				p	x			x		x																		x			M. pulse 90; St. Vitus
27	16	84		xx				x								x	x			x		xx	x										
28a	15	88														x					l			xx									Pupil: hay-fever
28b	6	98														x					x			xx									
28c	13	92														x					x			xx									
28d	10	84														x					x			xx									
29	16	108		x		oc			oc	x	x	x		oc							x		x	xx			x	oc	x				Sister (18 yr): hives, headaches, canker-sores
30							c				x												xx										Pupil: hay-fever
31	8	84											x	r																			F. pulse-range 72–104; pupil negative

oc = occasional, rh = rheumatism, con = constipation; col = colitis; g = grapefruit; e = "earlier eye-strain"; l = lumbago; c = chocolate; p = pain in stomach; r = rarely.

Table XXXVIb

			Pupil										Father										Mother										
	Age	Pulse-Rate	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Hives	Headaches	Heartburn	Indigestion	Canker-Sores	Dizziness	Diarrhea	Nervousness	Neuralgia	Phys. Tiredness	Remarks
N 1	11	88				?																											Almost no colds in family M. eczema due to tomato, orange, chocolate
N 2	7	80								x																				x			
N 3a	12	82																															
N 3b	13	80																															
N 4	13	84																												x		x	Sister age 6 neg. Parents has occasional slight cold
N 5	12	64																															
N 6	16	78																															
N 7	14	74													x	?																	M. 2 colds yearly
N 8	11	74								x										x											t		F. 6 sibs neg; M. 7 sibs neg.
N 9	8	88																															

t = "from abscessed teeth."

TABLE XXXVII

Showing the family history of familial nonreaginic food-allergy in 46 subjects of that condition

Name	Self	Father	Mother	Sibs
J. H. B.	2, 4, 5, 6, 8, 9, 10	2, 4, 7	2,3,4,6,8,9,10	
Mrs. E. B.	2, 8, 9, 10	4	8	
H. B.	1, 2, 3, 7, 8, 9, 12	?	4, 10	Dementia praecox
M. A.	3, 4, 8	Negative	1, 8	
Mrs. S.	2, 8, 10	?	2, 3, 6, 7, 9, 10	
L. B.	2, sinusitis	2, 4, 10	1 to 10 inclusive (convulsive seizures as child)	2, 4, 6, 8, 10
Mrs. C. B.	2, 5, 8, 12, sinusitis	9	2, 7, 8, 12	1
C. B.	Sinusitis, asthma	?	2, 3, 4, 8, 9, 10 gastric ulcer	
W.S.C., Jr.	1, 2, 6, 7, 8, 10	3, 4, 8, 10, 11, 12		
R. C.	1, 2, 4, 7, 8, 10, convulsive seizures	3, 4 (seizures)	?	
Father, J. D.	2, 4, 7, 8, 9	?	"Insane"	
J. F.	1–10 inclusive, sinusitis	3, 9	6, 7	2, 3, 6, 8, 9, 10
Dr. C. M. H.	1–8 inclusive, sinusitis, colitis	?	Migraine	2, sinusitis
K. M. (age 6)	1, 3, 4, 9, 10, 12	4, 8, 9, 10	8, 10	
Mrs. B. M.	5, 6, 8, 10, 12 (skin-negative), sinusitis	2, 8, 11	7, 9	
Mrs. C. S. McC.	2, 5, 6, 7	?	2, 9, 12	2
R. C. F.	2, 3, 8, 9, 10, chronic rhinitis	7	2, 4, 8, 9, 11	
M. F.	2, 4, 8, 10	?	1, 2, 3, 6, 8, 9, 10	
W. W. F.	2, 3, 4, 5, 10, petitmal	?	2, 8, 10	Epilepsy
J. G.	1, 2, 3	?	2	
H. H.	No symptoms; tachycardia (102) caused by 6 foods	?	2, 4, 9	2, 5
G. H.	2, epilepsy	2, 3, 7	1, 3, 5, 7, 8	
E. H.	4, 5	4, 5	2	
E. K.	1, 2, 4, 7, 8, 10	4, 12	7	1, 9, 10
J. K.	2, 3, 4, 5, 6, epileptiform seizures	4 (ulcer)	2, 3, 4, 8	
A. F.	2, 3, 5, 11, 12	12	2, 5, 7, 9, 10	5
E. L.	2, 3, 4, 5, 8, 9, 10, sinusitis	?	2, 7	2
N. O. L.	1, 2, 6, 8, 9, 10	1, 2, 5, 6, 8, 10	1, 2, 4, 5, 8, 10 arthritis	

TABLE XXXVII (*Continued*)

Name	Self	Father	Mother	Sibs
E. H L	2, 3, 4, 6, 7, 8, chronic rhinitis, Ménière's synd.	3, 4, 9, chronic rhinitis		
O. W. L	2, 3, 6, 8, 10, 11, 12	4, 11, 12	1 to 10 inclusive	1, 2, 5, 6, 8, 9, 10
M. M	1, 2, 5, 10	?	2, gastric ulcer	
L. P	2, 7, 8	2, 4, 7, 9	2, 6	
Mrs I. M. P.	6, 10	3, 4, 7	2, 9	
Dr. L. R	2, 3, 4, 6, 8, 9, 10	3, 7, 10	2, 3, 4, 6, 9, arthritis	2, 6, 7, 8, sinusitis
S S.	1, 4, 10	?	3, 4, 10	3, 4, 8
Mrs. M. S	2, 3, 4, 5, 6, 7, 9, 10, sinusitis	7, 9, gastric ulcer	1, 2, 7, 8, 9	1 to 10 inclusive sinusitis
E. L. H.	2, 3, 6, 8, 10 chronic rhinitis	?	2, 8, 10	Sinusitis
M M D.	2, 4, 5, 8, 10, 11, 12	11	2, 4, 6, 8, 10	
C. T.	2 to 10 inclusive	4, 6, 8, 10	2, 5, 9	4, 9, gastric ulcer
E. F C.	1, 2, 5, 6, 8, 9, 10	4, 11, 12	1 to 10 inclusive	2, 3, 6, 8, 10, 11, 12
A. R.	2, 8, 10	Negative	2, 9	3
J J. V.	1, 3, 5, 10, 12, acne	1, 9	?	1
Mrs N vW.	2, 3, 4, 5, 6, 8, 9, 10 sinusitis	?	2, 5, 6, 8, 9	
M. V	2, 5, 6, 8, 9, 10	?	2, 3, 4, 8	Negative (1)
A. M	1, 2, 4, 5, 11, 12	11	1, 2, 4, 5, 7, 8, 9, 10	

The numbers indicate the following symptoms:

1.	Hives	5	Canker-sores	9.	Neuralgia
2.	Headaches	6	Dizziness	10.	Physical tiredness
3	Heartburn	7.	Diarrhea or Constipation	11.	Hay-fever
4	Indigestion	8.	Nervousness	12.	Asthma

burn, while a common symptom of food-allergy and therefore suggestive, was not considered sufficient evidence, by itself, of the existence of food-allergy in the individual. The term indigestion is taken, by a few persons, to include the immediate discomfort caused by overeating. For this reason, the positive reply to that question in exceptional circumstances could not be depended upon alone as indicating the presence of food-allergy. Dizziness occurs in about 40 per cent of food-allergic persons and, with a few obvious exceptions, can be considered a characteristic symptom. Frequent diarrhea that is not infectious and chronic constipation have always disappeared after the elimination of the allergenic

foods. Nervousness is frequently mentioned as a symptom of food-allergic persons (about 60 per cent) but, on account of the possible misunderstanding of the word, an affirmative answer could not be accepted, by itself, as proof of the presence of food-allergy. Neuralgia is mentioned by about 35 per cent of affected individuals, and it seems thus to be a characteristic symptom of food-allergy. Physical tiredness, not due to physical exertion, is mentioned by more than 60 per cent of food-allergic persons; it is not mentioned by the nonallergic persons, and it disappears dramatically in the subjects of food-allergy that have been relieved of their other symptoms through the elimination of the allergenic foods.

TABLE XXXVIII

Number of Coca's 11 symptomatic indications of nonreaginic food-allergy in the children of parents with and without more than minimal evidence of such handicap

Number of Parents	Number of Children	Number of Symptoms*		Per Cent of the Children with >1 Symptom
		Father	Mother	
284	222	0–1	0–1	19
70	57	>1	0–1	37
206	165	0–1	>1	45
238	199	>1	>1	63

* Number of symptoms as reported by the parents both for themselves and the children.

These 10 symptoms† were selected for the questionnaire because they are the most common ones, and because they are well known to the average lay-person.

It has been stated above that in a survey of the incidence of food-allergy in Oradell, New Jersey, a positive family history of that condition could be elicited for all of the 25 school children who showed clinical symptoms of it. The same finding can be reported in the 46 food-allergic patients who presented themselves for the dietary diagnosis and whose family history was obtainable. The pertinent data in these cases are set forth in Table XXXVII, see pp. 210 and 211.

† To these 10 common symptoms of food-allergy has since been added chronic rhinitis ("sinusitis").

The hereditary nature of idioblaptic allergy seems to be clearly evident in even the limited data already assembled. It also seems possible that by a selection of a sufficient (not very great) number of large families, all of whose members are accessible to complete study, with respect to familial nonreaginic food-allergy in three generations, the mode of the inheritance can be determined.

Observations of Associates of Arthur Locke[1] in Stephens College, Columbia, Missouri

In this investigation, covering 643 college-girls and 798 parents, the authors determined, by personal inquiry or by questionnaire, which individuals had exhibited any of the 11 more common symptoms of food-allergy. Among the students they found 79 per cent who showed two or more symptoms, and since the "error entered into the estimation of number of symptoms present probably approached ± 1" these 79 per cent could be "considered as certainly possessive of symptoms regarded by Coca as evidences of an underlying, nonreaginic food-allergy."

An additional 15 per cent of the students reported one symptom; these were grouped with the 6 per cent reporting no symptoms in the authors' statistical analysis of the incidences of symptoms in parents and students, which is set forth in Table XXXVIII taken from their paper.

The authors write.

"The distribution of symptomatology between parent and child (Table XXXVIII) was familial in character. Those of the parents reporting the presence of two or more of symptoms A to L in the one of themselves, but not the other, reported an incidence of 37 to 45 per cent in the children as against an incidence of 19 per cent in the children of parents neither of whom had two or more symptoms and as against an incidence of 63 per cent in the children of parents both of whom had two or more of symptoms A to L."

[1] Brown, Graham, Niedringhaus and Locke: *J Immunol*, 46:101, 1943; Brown and Locke. *J. Missouri State M A*, p 99, April, 1943

CHAPTER XXIII

Idioblaptic Cigarette Sensitivity

THE PUBLISHED REPORTS with which the present one can best be compared or contrasted are the well-known ones of Harkavy and of Sulzberger. Both of these investigators examined subjects with respect to the possible presence of cutaneous sensitivity to tobacco, employing extracts of pure tobacco in the familiar intracutaneous tests, and both reported an unusually high percentage of positive reactions following direct tests in subjects with thromboangiitis obliterans.

In three series of such patients, Harkavy and his associates found 83, 86 and 87 per cent of positive reactors. Sulzberger and Feit in a smaller series of 24 cases of thromboangiitis obliterans found 78 per cent positive.

It is noteworthy that Harkavy[4] found in a control series of smokers 20 per cent and in non-smokers 12 per cent of positive reactors. Of obvious significance is the report of Sulzberger and Feit[6] that passive transfer of the cutaneous sensitivity (Prausnitz) failed in 21 of the 22 patients with thromboangiitis obliterans, 19 of whom showed positive intracutaneous reactions in the direct tests. The one patient whose serum contained passively transferable anti-tobacco reagin was, in like manner, found to be reaginically more sensitive to house-dust than to tobacco. This result is reasonably comparable with that reported by Aaron Brown[1] among his asthmatic patients—about 1 per cent were reaginically sensitive to tobacco.

Sulzberger and Feit[6] write:

"Our findings of the general lack of reagins, in spite of immediate wheal reactions to tobacco in thromboangiitis obliterans, is in contradiction to the results of Harkavy *et al.*† These observers report that the wheal hypersensitivity to

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† Harkavy, Hebald and Silbert: *Proc. Soc. Exper. Biol. & Med.*, *30*:104–107, 1932.

tobacco is associated with the presence of 'atopic reagins' to tobacco in thromboangiitis obliterans; and that they were able to demonstrate such reagins in 13 out of 20 tobacco-positive cases of thromboangiitis obliterans. And that: 'The presence of reagins to tobacco in these thromboangiitis cases indicates that we are dealing with individuals who were in all probability atopic, and that the positive phenomena are true antigen-antibody reactions.'"

Sulzberger and Feit[6] remark further:

"*However, our above reported results must classify thromboangiitis obliterans as a condition usually associated with a specific and marked hypersensitivity of the vascular apparatus of the skin to tobacco, but without any at present demonstrable connection with asthma, hay fever, and disseminated neurodermite, et cetera, and, in our cases, without regularly demonstrable reagins*" (authors' italics).

Some years ago, I had some part in arranging for an investigation of this question in a hospital service specializing in the study and management of thromboangiitis obliterans. The tests were carried out by an experienced investigator, Katherine L. Bowman, with ample clinical material and controls and with the skillful use of the Prausnitz experiment. The results confirmed those of Sulzberger and Feit in the clearly demonstrated absence of reaginic sensitivity to tobacco to any noticeable extent more in the thromboangiitis obliterans group than in the control group.

Miss Bowman summarized her hitherto unpublished findings as follows:

"1. Comparing the results obtained by testing 69 thromboangiitis obliterans patients and 60 normal smokers with tobacco and other allergens, it was found that there is practically no difference in the percentage of positive reactions to tobacco in the two groups, if one-plus and plus-minus *reactions be disregarded.*

"2. *If* the one-plus and plus-minus reactions be included, the difference between the percentage of positive reactions to tobacco obtained in the thromboangiitis obliterans group and that obtained in the normal group is not of sufficient magnitude to be significant.

"3 The skin response to histamine 1·1000 was found to be slightly greater in the thromboangiitis group than in the normal group.

"4. The incidence of positive reactions to ragweed pollen, timothy pollen, and horse dander, was found to be equal in both groups, showing the same distribution of allergy in the two series.

"5 With one exception, passive transfer of the tobacco reactions in the thromboangiitis obliterans group was successful only when a positive passive transfer was obtained with one or more of the other allergens tested.

"6. The incidence of positive tobacco reactions was found to be even higher in a group of 23 normal nurses than in the group of 60 normal men."

CHAPTER XXIII

Idioblaptic Cigarette Sensitivity

THE PUBLISHED REPORTS with which the present one can best be compared or contrasted are the well-known ones of Harkavy and of Sulzberger. Both of these investigators examined subjects with respect to the possible presence of cutaneous sensitivity to tobacco, employing extracts of pure tobacco in the familiar intracutaneous tests, and both reported an unusually high percentage of positive reactions following direct tests in subjects with thromboangiitis obliterans.

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† Harkavy, Hebald and Silbert: *Proc. Soc. Exper. Biol. & Med.*, 30:104–107, 1932.

Three patients have been observed in whom petit mal (two) or grand mal (one) seizures have been induced by cigarette smoke or smoking.

In the first of these, a petit mal reaction followed within a few minutes after the patient (M. S., 11 years old) began breathing through the folds of a handkerchief into which cigarette smoke had just been breathed.

In the second epileptic patient (M. A., 18 years old) a lumbar sympathectomy (Danzis) had left only a small list of dietary allergens, chiefly egg. Over a period of three months thereafter, she was in daily technical service without seizures. On two occasions in that period while she was avoiding all food allergens, she was heavily exposed at her apartment to cigarette and cigar smoke. Each time she suffered a seizure, once without convulsion and once with typical grand mal convulsions. On both occasions the seizure occurred very soon, within about a half hour, after the exposure to the smoke.

The third epileptic patient (J. K., aged 30) who had been avoiding his 10 pulse-accelerating food categories and tobacco for eight months and had been free from seizures during that time, deliberately induced a grand mal seizure by smoking cigarettes. The smoking began on a Thursday evening. On waking Saturday morning, the subject experienced sensations that he recognized as those customarily presaging a seizure. He resumed smoking and in the late morning fell in a major convulsive seizure in which he was attended by a nearby physician, who recognized the condition as epileptic and prescribed dilantin. The patient disregarded the prescription. He has not smoked in the succeeding five years and has observed his rather stringent dietary restrictions. In that period there have been no seizures.

In the past few years, I have had more frequent occasion to test allergic persons for nonreaginic sensitivity to cigarette smoke, and had acquired an impression that this particular sensitivity is *perhaps* more common than any other. My special examination of this question has amply confirmed that impression, although the number of suitable persons at disposal for the study is not sufficient to permit anything more than an approximate estimate of the percentage incidence of cigarette sensitivity among the population.

The reference to "suitable persons" calls for explanation. The satisfactory identification of an allergen through the criterion of specific tachycardia can usually be made only if the individual's normal pulse range is known and if he is *not*, at the time of the test, under some food-allergic influence. For example, L. B., whose pulse rose from 60 to 69 while smoking was not on that account allergic to cigarettes because her normal range is known to be from 58 to 70; but the rise in Dr. J. from 60 to 72 indicated

Conclusions

"1. There is no evidence in this study to indicate that there is a higher incidence of *specific* cutaneous sensitivity to tobacco in thromboangiitis patients than in normal men.

"2. Any slight excess in the number of one-plus reactions to tobacco which may have been found among the thromboangiitis obliterans cases might possibly be due to the same factor which is responsible for the increase in the response by this group to the nonspecific excitant, histamine 1:1000."

It is seen that Miss Bowman agrees with Sulzberger and Feit in denying the existence of a reaginic (transferable) sensitivity to tobacco as characteristic of thromboangiitis obliterans. However, her findings do not support the conclusion of those investigators that thromboangiitis obliterans is "usually associated with a specific and marked hypersensitivity of the vascular apparatus of the skin to tobacco without regularly demonstrable reagins."

In the extended study in the past 10 years of over 1000 patients affected with idioblaptic allergy, I have encountered a number of instances of nonreaginic sensitivity to cigarette-smoke as recognized by symptoms and accompanying specific tachycardia. In the greater part of this period, I tested only the habitual smokers in this respect, overlooking the possibility that exposure to the smoke of others can suffice to cause allergic symptoms, and forgetting that the constitutional nonreaginic sensitivity to an allergen is frequently established long before the subject has arrived at the age of *symptomatic* reactivity.

Soon after the first instances of symptomatic cigarette sensitivity were identified, all new patients were requested not to smoke while the early exploratory tests were being carried out; and I was astonished to find that in a few instances cigarette smoke was the sole pulse-accelerating allergen and that all symptoms disappeared shortly after smoking was discontinued.

Case 1. In J. B., a chemist, the allergic symptoms, that is, those which disappeared in the period in which the subject reduced his smoking to a mere evening test (one cigarette), were *abnormal tiredness*, "nervous indigestion," severe headaches, neuralgia, et cetera. The daily pulse range in the period (barring the test) was 68 to 78. The highest count while smoking was 92.

Case 2. In Mrs. S., aged 28, the allergic symptoms (meaning in this case also those that disappeared permanently after she discontinued smoking) were "deadly tiredness," nervousness, fearfulness, constant "chest colds," painful, crampy menstruation and constipation. After avoidance of smoking, the pulse range of this patient was 70 to 76. The highest count while smoking was 100.

TABLE XL

Pulse records of smoking tests in cigarette-insensitive persons

	Sex	Normal Pulse Range	Rate Before Smoking	Rate at Intervals After Starting Smoking Time in Minutes					
				3′	6′	9′	12′	15′	30′
C W. C.	M	61–69	(1) 64 (2) 61	65 61	66 68	66 56	66 64	62 (S) 62 (S)	
L. B	F	58–70	70, 60	60	69	66	65 (S)	65	
S I H.	M	68–80	72	72	72	72	72	72 (S)	
Dr W.	M		74		74	74		76	74 (S)
D. F.	M	58–68	72	72	72	72	68	68 (S)	
R. S	F	42–56 (?)	47, 45	45	44	43	43	43 (S)	
W. S C, Jr	M		66	66	67 (S)	67	65	68	
M. C.	F		62	60	56	56	58	62 (S)	
D J	M	70–76	72, 74	76	76	76	76	76 (S)	
R La T.	M		68	68	68	68	68	68 (S)	
H H.	F	60–66	(1) 66 (2) 64	Smoking one hour (64–66) 66	66	64	66	64	66 (S)
Dr. S.	F	66–76	74	74	66	66	70	74 (S) inhaled	
F. S	M	72–84	84	84	84	84	84	84 (S)	
Mrs. J	F	68–76	(1) 76 (2) 76	76 76	76 76	78 (S) 76 (S)			
Dr. R.	M	70–76	76, 72	30′ 74	60′ 74	90′ 72	Continuous smoking		
M. P.	F	59–72	60, 59	3′ 59	6′ 60	9′ 59		14′ 60 (S)	25′ 62
E. B	F	72–76	82 82	3′ 82				60′ 82	20′ 82 (S)
R. K. P.	M	51–61	56		5′ 57	15′ 57	30′ 55	45′ 57	75′ 54 (S)
A. S.	F	70–76	70	3′ 66	10′ 66	15′ 68	24′ 70	35′ 70 (S)	

S = Stopped smoking

TABLE XXXIX

Pulse records of smoking tests in cigarette-sensitive persons

Subject	Sex	Normal Pulse Range	Rate Before Smoking	Rate at Intervals After Starting Smoking Time in Minutes 3′	6′	9′	12′	15′	30′	Other	
M. S.	F	64-74	72, 72	76	76	76	78	78 (S)	74		
M. M. D.	F	70-80	78	88	88 (S)	84	84	84			
L. P.	F	60-72	64	80	76 (S)	80	74	72			
A. W.	F	66-78	73		74	87 (S)		84	80		
W. S. C.	M	*46-62*	*62*	*94*	*90 (S)*	*90*	*88*	*85*			
J. B.	M	68-78	78		92 (S)						
A. R.	M	70-84	76, 76	80	84 (S)			90	90		
A. K.	M	68-76	72	86	82	82	82	82 (S)			
E. A. C.	M	*69-81*	*85, 85*		*119*	*103 (S)*			40′/62		
B. S	M	*68-84*	*82, 84*	Cold empty tobacco pipe in mouth		*104 (S)*			40′/90		
J. C	M	49-64	57, 64				30′/74	60′/76	90′/74 (S)		
Dr. J.	M	*58-62*	60					72	70	60′/68 (S)	
E. C. R.	F	69	79	4′/90 (S)				79			
Mrs. S	F	70-76	72		5′/100 (S)			92	90		
F. M.	F	*66-74*	*66*	stopped smoking	{15′/—	20′/82	30′/76	60′/70			
M. A.	F	58-73	71		5′/92 (S)						
M. O. N.	F	Min = 64	80	2′/92	5′/98 (S)				80		
G. M.	M	66-76	74	1′/80	3′/78	6′/78	9′/80 (S)	12′/72	15′/72		
M. M.	F	60-72	72	1′/*90*	3′/92 (S)	6′/*86*	9′/*86*	12′/*78*	15′/*80*	18′/*76*	21′/74; 24′/72

S = Stopped smoking.
Not included in this list are two persons *known to be clinically sensitive to cigarette smoke in whom* the smoking test was not done
Dr. Clark's case and the case of J. K (epileptic) are also not included.

tion without headache in another, and in still another severe headaches without constipation, all proved to have been caused by smoking.

Against an explanation of these symptoms on a toxic basis speaks also the fact that in about half of the individuals *tested* and reported in this article the pulse-rate was not perceptibly affected by smoking and that symptoms were experienced by only a small fraction of the entire group studied.

In animals toxic doses of nicotine do not exhibit such great variation.

The foregoing considerations, together with the demonstrated significance of allergic tachycardia, justify the separation of the two groups of persons in the Tables.

In Tables XXXIX and XL are listed, respectively, cigarette-sensitive and cigarette-insensitive persons, all individuals of both groups having been identified as subjects of idioblaptic allergy. It is noteworthy that in both groups the two sexes are about equally represented. Nearly all of the subjects had been relieved of their allergic symptoms through the pulse-controlled dietary analysis. Hence, the tests of the effect of cigarette smoking were in each instance carried out by persons having a long experience of numerous daily pulse-counts and a dependably exact acquaintance with the normal and the abnormal variations of their pulse rate.

This consideration alone justifies the interpretation of the pulse-record of G. M. as indicating a specific allergic reaction to the cigarette smoke, although the maximal rate was only four beats above his normal maximum. However, this subject had been for some time aware of a distinct clinical sensitivity to tobacco smoke (nausea, acute conjunctivitis).

In the 2*nd* edition of this monograph,[2] on pages 86 and 87, I have discussed briefly the question whether the significant allergic excitant of tobacco may be nicotine. This question seems a reasonable one because of the known instances of severe allergic symptoms caused by other alkaloids (quinine, morphine). I mentioned also the case of a colleague who experienced unpleasant symptoms when smoking *ordinary* tobacco but not when smoking "denicotinized" (Sano) tobacco. I am indebted to that colleague,

sensitivity in this patient since his normal range is 58 to 62. On the other hand, if the test is made several hours after a meal when the pulse is steady, a rapid rise of 16 beats or more, especially if the highest count is 88 or higher, clearly indicates specific sensitivity *to cigarette smoke, even if the subject's pulse character has not* been determined.

Before taking up the statistical survey of cigarette sensitivity, it is necessary to discuss a certain interpretative complication.

Tobacco occupies a special position among allergens by reason of the high primary toxicity of its characteristic chief alkaloid nicotine. Hence, the question arises how shall one distinguish the toxic symptoms of tobacco from the allergic; and since this question applies, in the present discussion, only to man it would seem to be a reasonable requirement that the study of the primary toxic effect of tobacco be made in persons known to be free from familial *allergy. However, since only about 10 per cent of the population* can qualify in that respect, it may be considered probable that most of the human subjects who have served as experimental material in such studies were allergic, and it is conceivable that they *may* have been *selected* because of their susceptibility to tobacco, which was not recognized as allergic.

The symptoms of "tobacco-poisoning" such as commonly occur in smoking, are just those that are sometimes observed in persons who are extremely allergic to nontoxic foods—"burning in the mouth, a scratching sensation of the pharynx, increased salivation (later dryness in the mouth), headache, vertigo, confusion, disturbed vision and hearing, nausea, vomiting and diarrhea. Pulse at first increased, then irregular. Subsequent depression."*

Three of these symptoms may also be toxic, namely, nausea, vomiting, and diarrhea, since they are observed in presumably *nonallergic lower animals.*

The observations described in the present writing make it seem rather likely that the symptoms observed following smoking in some persons are usually allergic rather than toxic. Certainly no pharmacologist would attempt to explain on a nonspecific, toxic basis the occurrence of epileptic seizures in one person, constipa-

* Slightly altered from Torald Sollmann's *Manual of Pharmacology*, fifth edition, describing the effects of poisoning with pure nicotine on man, p. 393.

tion without headache in another, and in still another severe headaches without constipation, all proved to have been caused by smoking.

Against an explanation of these symptoms on a toxic basis speaks also the fact that in about half of the individuals *tested* and reported in this article the pulse-rate was not perceptibly affected by smoking and that symptoms were experienced by only a small fraction of the entire group studied.

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Dr. Guy W. Clark, for the following history of his case and the record of his pulse-counts in the several tests of ordinary and Sano tobacco.

The patient, a man aged 59, has never had hives or heartburn. He has had evidence of indigestion manifested by gas formation and the frequent appearance of canker-sores, but he has had no "nervous sensation," neuralgia, hay-fever, asthma or any other signs of food allergies except occasional dizziness when smoking ordinary tobacco. Patient inclined to be underweight but very active in outdoor occupation. He has been an off-and-on smoker from age 20 to 40. For the last 20 years has smoked quite regularly but never to excess, 12 to 14 cigarettes per day maximum.

In 1939 he experienced an angina-like pain and was examined by a well-known cardiologist who found no organic defects. From the patient's description of his troubles (tachycardia, frequent pain in the left side and excessive gas formation), the physician advised him to stop smoking for a while and see if any benefits were noticed. Being a pharmacologist and quite familiar with drug action, the patient, feeling that the moderate smoking could not be the cause of the trouble, declined to follow the advice of the physician and continued smoking.

In 1942, because of excessive gas formation, the patient consulted an eminent gastroenterologist in Chicago, and after a complete examination, including x-ray of the entire intestinal tract, the advice again was to stop smoking. While discussing the situation with another physician in New York City, it was suggested that "denicotinized" cigarettes be substituted for the regular brand which had been used. The patient has now used "denicotinized" tobacco mostly as cigarettes but also in pipe-tobacco for more than three years and has been entirely free from the cardiac symptoms and practically free from any signs of indigestion.

While recovering from an eye operation last spring, the patient decided to stop all smoking; this, as on previous similar occasions, was followed by some improvement in appetite. This patient has always had low blood pressure, 110 to 120 systolic, and a customarily slow pulse rate, 60 to 66.

Experiment

Pulse Rate

Dec. 15—6:00 P.M.—60 (before dinner)
62
6:25 P.M.—68 (right after first puff of "denicotinized" cigarette)
6:30 P.M.—78
6:35 P.M.—80 (end of cigarette)
8:45 P.M.—62
64
Dec. 18—2:40 P.M.—68 (soon after using tuamine inhaler)
70
2:44 P.M.—70 (repeated tuamine, both nostrils)
2:45 P.M.—74
2:46 P.M.—76
3:05 P.M.—66

3:08 P.M.—66 (lighted standard brand of cigarette, long)
3:10 P.M.—86
3:15 P.M.—90
3:20 P.M.—84 (end of cigarette)
6.00 P.M.—60 (before dinner)
62
6:45 P.M.—64 (right after dinner)
7:00 P.M.—68
7:25 P.M.—64
7:30 P.M. (lighted "denicotinized" cigarette)
7:32 P.M.—74
7:35 P.M.—74
7:37 P.M.—76 (end of cigarette)
7:40 P.M.—78

Dr. Clark's experiment, as he says, does not prove the allergic excitant to be nicotine; it does not even indicate that there are not more than one allergen in the usual smoking forms of tobacco. However, it leaves no doubt that the partly denicotinized tobacco is, whether for a qualitative or a quantitative difference, distinctly less allergenic than ordinary tobacco.

It is, of course, conceivable that subjects more allergic to the cigarette allergen would not experience the differences between the two products that are reported by Dr. Clark. With the expression "more allergic" I am referring to shock-organs, particularly the renal, that may be affected by lesser concentrations of the tobacco allergen and which are not involved in Dr. Clark's case.

Dr. Clarence W. Lieb has called my attention to the study of Harry L. Segal,[5] in which much of my findings were anticipated, though differently interpreted.

In this study of six patients, whose chief complaint was fatigue (one of the most frequent allergic symptoms), a constant finding was marked acceleration of the heart-rate (up to 100 or more in all). The fatigue was "relieved" in all of these persons after cessation of smoking.

Segal is careful to report that "not all patients who are tired and who smoke are improved by discontinuing the smoking." Thus he noticed the limitation of the described relationship to *certain* individuals, yet this specificity did not suggest allergy to him, and after excluding other irritants from consideration, he ascribed the

effects to the pharmacologic action of nicotine, which he found effective in some persons in relatively small "dosage."

Summary

1. Reaginic sensitivity to tobacco affects only a small percentage of the population (about 1 per cent according to Aaron Brown). Symptoms proved to be due to reaginic sensitivity to tobacco have not been reported.

2. A number of instances of idioblaptic (nonreaginic) sensitivity to cigarette smoke are described in whom different characteristic symptoms were experienced (epileptic seizures, dizziness, headache, constipation, abnormal tiredness, indigestion, "fearfulness," menorrhagia). In all cases the symptoms ceased when smoking was discontinued.

3. With the criterion of specific tachycardia, it has been found that about half of all nonreaginically food-allergic persons of both sexes are allergically sensitive to cigarette smoke.

4. In one case the smoking of partly denicotinized tobacco caused an elimination of the symptoms (dizziness) and a distinct reduction of the tachycardia (two tests) that regularly followed smoking of ordinary tobacco.

References

1. Brown, A.: *New York State J. Med., 118*:333, 1923.
2. Coca, A. F.: *Ann. Allergy, 5*:95, 1947.
3. Coca, A. F.: *Familial Nonreaginic Food-allergy*, Ed. 2. Springfield, Illinois: Charles C Thomas, 1945
4. Harkavy, J.: Skin reactions to tobacco antigen in smokers and nonsmokers, *J. Allergy, 5*:131–134, Jan. 1934.
5. Segal, H. L.: Cigarette smoking, *Am. J. M. Sc., 196*:851–861, 1938.
6. Sulzberger, M. B. and Feit, E.: Studies in tobacco hypersensitivity, *J. Immunol., 24*:425–432, 1933.

CHAPTER XXIV

The Incidence of Idioblaptic Allergy Among Persons Affected with Cancer of the Breast

IT HAS BEEN SHOWN[1,2] (see Chapter XIII) that idioblaptic allergy causes a lowering of the normal resistance of the human body to a low-grade infection, such as common cold. This lowering of resistance could not be thought to be due to a special localization of the allergic disease in the upper respiratory passages because in many cold-susceptible persons no such localization could be assumed to exist.

Quite the contrary. It has been a common experience that after dietary relief of the allergy there is a rapid, often considerable loss of weight that must be ascribed to the elimination of fluid from tissues involved in allergic edematous infiltration. The large volume of this fluid (5 to 15 pounds) precludes its having been localized in limited areas and suggests a wide distribution throughout the body.

The thought occurred to me that the physiologic abnormality which causes this demonstrated impairment of the resistance to infection may also predispose the tissues to the invasive growth of malignant tumors. Indeed, certain of my earlier experiences, together with those of other observers, to which I shall presently return, have led me to surmise that if this idea be correct and if the abnormality were remedied and the normal tissue-resistance restored, the malignant cells might not be able to maintain them-

[1] Coca, A. F. Familial nonreaginic food-allergy as a predisposing cause of common cold, *J. Lab. & Clin. Med.*, 26:757–765, 1941.

[2] Brown, Graham, Niedringhaus and Locke. Nonspecific factors in resistance. VI. Incidence of common cold in persons with and without the accessory symptomatology of nonreaginic food-allergy, *J. Immunol.*, 46:101–111, 1943.

TABLE XLI

299 patients grouped according to the number of their food-allergic symptoms

No. of Symptoms	No. of Cases	No. of Symptoms	No. of Cases
11	2	4	47
10	7	3	41
9	18	2	19
8	28	1	10
7	35	0	3
6	43		
5	46		299

TABLE XLII

Nineteen patients with 2 symptoms

	Symptoms	Pulse-Rate One Count	Pulse-Range	Other Data
B. F.	2, 7	90	—	
R. M.	2, 6	105	—	
M. O.	2, 5	120	—	
S. S.	2, 4	105	—	
B. B.	8, 9	112	—	Headaches with period
F. C.	3, 7	92	72 to 92	Cannot eat cucumber, radish
H. C.	3, 4	84	—	
B. D.	2, 5	88	—	
H. F.	2, 7	78	62 to 80	Hypertension
I. Rab.	2, 9	98	—	
I. Rap.	2, 8	82	64 to 82	
E. D.	5, 6	—	—	
C. F.	2, 8	86	—	
E J.	2, 8	120	—	
A. R.	9, 10	96	—	Hypertension
E. M.	4, 8	92	—	Occasional diarrhea
H. McK.	2, 8	98	—	
A. P.	2, 4	88	—	Gall-bladder pain; rheumatism
A. V.	2, 5	72	—	

1 = Hives 4 = Indigestion 7 = Constipation 10 = Physical tiredness
2 = Headaches 5 = Canker-sores 8 = Nervousness 11 = Chronic rhinitis
3 = Heartburn 6 = Dizziness 9 = Neuralgia

selves in the now hostile environment, much less continue their invasive growth.

The approach to this question was obviously to determine, by appropriate examination of a sufficient number of cancer-patients, whether all or nearly all of them could be identified as subjects affected by food-allergy.

I had the good fortune to interest the late Dr. James Ewing and

Dr. Frank E. Adair in the problem and was permitted to interview 299 patients in the Breast Clinic of Dr. Adair at the Memorial Hospital in New York.

All of the 299 patients had suffered a tumor of the breast; one was a male. Each patient was questioned as to a history of attacks of any of the most common 11 symptoms (page 14) of food-

TABLE XLIII

Ten patients with one symptom

	Symptom	Pulse-Rate and/or Range	Other Data
M B	4	90 to 108 (one day)	Gall-bladder operation 1924; pulse rose from 90 to 106 $1^1/_2$ hr. after eating chocolate
E. K.	2 (migraine)	98	
E R.	4	102	
T K.	8	64 to 90 (one day)	"Milk makes her sick"
C M.	1	50 to 104 (one day)	Urticaria caused by peaches
L. R.	7	74	
F S.	8	128	
B. B.	6	90	
R. F	2	92 E S	
M S	6	98	

E.S = extrasystoles

TABLE XLIV

Three patients with no symptom

	Pulse-rate and/or Range	Other Data
E R.	64 to 76	Nonmalignant tumor
M R.	100 to 120	"Apple always causes gastric pain"
A. S.	74	Nonmalignant tumor

allergy—hives, headaches, heartburn, indigestion, canker-sores, dizziness, constipation, nervousness, neuralgia, physical tiredness and chronic rhinitis. Since a rapid pulse, in the absence of other obvious cause, is a useful objective criterion of the food-allergic constitution, the pulse-count was taken at the interview in many of the patients, especially in those reporting fewer than three food-allergic symptoms.

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S. S.	2, 4	105	—	
B B.	8, 9	112	—	Headaches with period
F. C.	3, 7	92	72 to 92	Cannot eat cucumber, radish
H. C.	3, 4	84	—	
B. D.	2, 5	88	—	
H. F.	2, 7	78	62 to 80	Hypertension
I. Rab.	2, 9	98	—	
I. Rap.	2, 8	82	64 to 82	
E. D.	5, 6	—	—	
C. F.	2, 8	86	—	
E. J.	2, 8	120	—	
A. R.	9, 10	96	—	Hypertension
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A. P.	2, 4	88	—	Gall-bladder pain, rheumatism
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1 = Hives; 2 = Headaches; 3 = Heartburn; 4 = Indigestion; 5 = Canker-sores; 6 = Dizziness; 7 = Constipation; 8 = Nervousness; 9 = Neuralgia; 10 = Physical tiredness; 11 = Chronic rhinitis

selves in the now hostile environment, much less continue their invasive growth.

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has been relieved by mere avoidance of the respective food-allergens.

Although no symptom of food-allergy was reported by M. R., Table XLIV, the high rate and range of the pulse, together with the identification of a specific food as a cause of gastric pain, mark this patient as a person of food-allergic constitution.

All the 299 patients, except E. R. and A. S., Table XLIV, were affected by clinically malignant tumor of the breast.

By way of contrast with the apparently constant association of familial nonreaginic food-allergy with cancer of the breast, we present the following three relatively small series of *unselected* persons who were examined in somewhat the same way with respect to the incidence of food-allergy.

Series 1 consists of 42 persons, most of them student nurses, who were questioned as to food-allergic symptomatology and who also observed the pulse-rate 14 times daily for two days. Among these individuals there were seven (16 per cent) who reported an entirely negative personal and family history of food-allergy. The maximal pulse-count among these seven in the two-day records was 82, and the widest range of the pulse-counts (from low to high) in the two days was 10 (see Table, p. 191).

Thus, by all four methods of examination (namely—personal history, family history, maximal pulse-rate and pulse-range) these seven persons were free from food-allergy.

Series 2 consists of 40 families, a total of 140 individuals. The details of the examination of this group have been published[3] Food-allergy was certainly present in 31 of the families, questionably present in four, and probably absent in all the 31 individuals comprising five families (22 per cent of individuals; $12^1/_2$ per cent of families).

In series 2 dependence was placed chiefly upon histories obtained from the parents.

Series 3 consists of 28 hospital employees who were examined by Dr. Charlotte Munn at the Rockland State Hospital in Orangeburg, New York. Three of these (nearly 11 per cent) were found to be food-allergy-free—one with a wholly negative family history

[3] Coca, A. F.: Familial nonreaginic food-allergy. Monographic report. Springfield, Ill., Charles C Thomas, 1943.

In Table XLI the patients are grouped according to the number of their food-allergic symptoms. Accepting the existence of three symptoms as satisfactory, presumptive evidence of a food-allergic constitution, we present in Table XLII the pertinent data concerning the 19 persons who reported two symptoms; in Table XLIII those concerning the 10 reporting one symptom; and in Table XLIV those concerning the three who reported no symptoms.

In our experience with the pulse-rate, we have found that a rate of 88 or more is seen in adults only in food-allergy, with certain exceptions that usually are readily recognizable; such as infections, hyperthyroidism, marked sunburn, extraordinary excitement or physical exertion. Thus, although a pulse-count of 88 or more does not prove the existence of the food-allergic state in a particular person, it can be looked upon as supportive evidence equal in significance to a single allergic symptom.

Most of the patients listed in Tables XLII, XLIII, and XLIV could be interviewed only once; however, we endeavored to have some of them come in for a second special examination.

Unfortunately, only few responded, but in all cases the additional data confirmed the impression derived from the questionnaire. The patients arrived at the clinic without having eaten breakfast. After a 10-minute rest the pulse was counted and a liberal varied breakfast was eaten. Three pulse-counts at half-hour intervals were made and the patients then rested till lunch-time, when another ample and varied meal was taken. Again the pulse was counted before eating and at three half-hour intervals thereafter. The figures under the heading "pulse-range" represent the low and the high counts in the respective person. If no figures appear in this column opposite a certain name, this means that the respective person was not available for this test.

We should mention the following points:

Heartburn and indigestion (gas, nausea, pain, etc.), H. C., Table XLII are common food-allergic symptoms, as are also headache with nervousness, C. F., Table XLII and headache with canker-sores, A. V., Table XLII. The marked constipation in L. R., Table XLIII, speaks strongly for a food-allergic constitution. In our experience, every case of constipation—12 patients—

has been relieved by mere avoidance of the respective food-allergens.

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[1] Coca, A. F.: Familial nonreaginic food-allergy Monographic report Springfield, Ill., Charles C Thomas, 1943

(father, mother, two brothers and six sisters); two with a unilaterally negative parental history, the other parent in each case reporting only one symptom.

Thus it is seen that if the 297 subjects of cancer of the breast had been no more affected by food-allergy than the unselected groups, it could have been conservatively expected that about 12 per cent—say 35— of them would have been found free from food-allergy with the method of examination employed.

Later surveys, each of more than 200 persons, in which additional criteria of the idioblaptic constitution (especially susceptibility to common cold) have indicated that approximately five per cent of the population are free from idioblapsis. According to this proportion, at least 14 of the 297 cancer subjects should have been nonallergic.

The statistical evidence thus far assembled seems, then, to suggest a close-enough relationship of the two pathological phenomena to justify experimental study designed to test the nature of that relationship. For such experiment, two possible courses are at hand; that is, an attempt to remove the allergic impairment of tissue-resistance either 1) by pulse-controlled trial-diet alone; or 2) by the operation of sympathectomy (see Chapter X) followed by trial diet.

Discussion

There are many recorded observations upon the more or less rapid, sometimes complete and permanent disappearance of malignant tumors. In a number of instances these dramatic (because exceptional) occurrences followed procedures that have been applied also in the treatment of certain food-allergic symptoms, especially nonreaginic bronchial asthma and chronic urticaria, and likewise with much less than uniform success.

Two such cases previously reported by Coca and Gilman[4] are described in full by Coca, Dorrance and Lebredo.[5] Both patients were subjects with recurrent carcinoma and both received two injections of a fluid obtained from finely ground and centrifuged

[4] Coca, A. F. and Gilman, P. K.: *Philippine J Sc. Med.*, Dec., 1909.

[5] Coca, Dorrance and Lebredo: A report of the results of the vaccination therapy as applied in 79 cases of human cancer, *Ztschr. f. Immunitätsforsch. u. exper Therap.*, *13*:543-585, 1912.

cancer-tissue. In one of these the hard inoperable 10 cm tumor of the neck had "practically disappeared" about two weeks following the second subcutaneous injection of 10 ml of cancer-fluid. In the second patient a highly malignant inoperable carcinoma of the buccal mucous membrane was curetted for "vaccine"-material and the resultant fluid was injected subcutaneously in two doses at a two-week interval. The wound healed by granulation with no evidence of malignant growth, and examination 18 months later failed to discover any sign of recurrence.

The report of Coca, Dorrance and Lebredo includes reference to the similarly successful experiments of LeBertrand.[6]

This treatment with the juice of the patient's tumor or with that of a similar tumor from another human being may be classed with the nonspecific "protein-therapy" that is used, sometimes with success, in human allergic diseases. It recalls particularly the procedure known as "autohemotherapy," which in principle can hardly be distinguished from treatment by injection of sterile milk or bacterial vaccines.

A number of European and some American investigators (see Walzer,[7] p. 297) have described the successful use of tuberculin-therapy in a few cases of bronchial asthma. According to Walzer,[7] the relief obtained in some cases may persist "for a year or more during which interval treatment had been discontinued entirely."

A number of years ago I administered a course of tuberculin-therapy (avian type) in a case of lymphosarcoma of the bronchial and cervical lymphatic nodes (Mrs. B. R.). The diagnosis was made by James Ewing and William J. Elser from sections of enlarged cervical nodes obtained by biopsy. The large mediastinal tumor was clearly seen in x-ray photographs. At the end of the several months' course of weekly injections, the previously involved cervical nodes were no longer enlarged and the mediastinal tumor had disappeared. In the 14 years in which the case was followed there has been no recurrence.

Possibly the well-known report of W. B. Coley concerning the favorable influence of bacterial filtrates upon sarcoma are of significance in this connection.

[6] LeBertrand. *Ann. de la Soc. de Med d'Anvers*, Oct.-Dec., 1909
[7] Walzer, Matthew: *Asthma*. Springfield, Ill., Charles C Thomas, 1931.

Summary

1. Among a group of 297 persons affected with clinically malignant tumor of the breast, none was found in whom food-allergy could reasonably be thought to be absent.

2. Among three groups of unselected persons not known to be affected with malignant growth and totaling 210 individuals, 41 were found to be free from food-allergy. The lowest percentile incidence of food-allergy-free persons in the three groups was about 11.

It should be stated that in every patient the diagnosis with respect to the malignancy or non-malignancy of the tumor had been established through the usual microscopic examination after operation.

None of the patients presented recurrence of the growth at the time of the interview concerning their food-allergy.

CHAPTER XXV

Is Multiple Sclerosis a Manifestation of Idioblaptic Allergy?

BY

MILO G. MEYER, M.D., ALAN JOHNSTON, M.D.,
AND ARTHUR F. COCA, M.D.

WE HAVE TAKEN as a reasonable working hypothesis, one which probably will long defy complete, direct, anatomical verification, that idioblaptic allergy may cause various central nervous symptomatology according to the various localizations of the shock-tissue in the central nervous system. There is preliminary clinical evidence pointing to the idioblaptic nature of the following:

recurrent headache *stammering* *irritability*
epilepsy *multiple sclerosis*

The case of recurrent headache, including migraine, provides a well defined pattern with which the others can be comparatively studied. That pattern can be drawn as follows:

(1) The condition may be nearly constant, with exacerbations ("attacks") of varying duration and more or less extreme severity, or there may be intervals of complete freedom from the condition punctuated with severe attacks.

(2) There may be extended remission followed by recurrence.

(3) The patient always presents a typical idioblaptic irregularity of the pulse and nearly always one or more other idioblaptic symptoms or consequences (common cold).

(4) The condition always disappears immediately after the

pulse has been stabilized through avoidance of pulse-accelerating allergens (see Chapter VII).

(5) *It regularly recurs upon re-exposure* to some (not necessarily all) of the identified allergens.

This pattern has been exhibited not only by all cases of migraine *and lesser recurrent headaches but by all instances of the other 10* commoner idioblaptic symptoms. It has been exhibited also by the subjects suffering from any of the other four affections of the central nervous system mentioned above.

It would seem reasonable, then, to suspect all of the four symptomatic entities of a common cause and to translate that suspicion into action; especially since the indicated action consists merely in applying the simple course of the pulse-dietary diagnosis which has proved so effective in the relief of the many common symptoms just referred to.

It may be profitable to discuss the observations which have been made on three cases of multiple sclerosis by Milo G. Meyer and on one each by Alan Johnston and A. F. Coca.

So far as we know, the first report of successful preventive treatment of multiple sclerosis on the basis of an allergic etiology was made by Milo G. Meyer in 1947.[1] In a footnote referring to two cases listed as "successfully" treated with the pulse-dietary method, Meyer wrote, "Multiple Sclerosis is a long and unpredictable illness. The patients mentioned have had a remission for better than fifteen months, but conclusions cannot be drawn from that at this time."[2]

However, he has extended those observations over a period of three years and adds a third case.

Cases Observed by Milo G. Meyer

Case 1. This woman is 34. The diagnosis was made originally by a neurologist at Chicago, Ill, five years ago. She had nystagmus, marked cerebellar disfunction and a spastic left limb. Lumbar puncture showed six cells (lymphocytes) and a gold curve 3122220000. Protein and sugar normal, serology negative. She had had migraine for years. She is egg-sensitive only. At times, especially the last two Christmas seasons, she ingested eggs. This, on both occasions, has resulted in a return of nystagmus, vertigo and increased spasticity of her limb and also of the migraine headaches. This last Christmas her symptoms were so severe that I gave her histamine for about three weeks with definitely good results.

Case 2, which I believe is quite solid, is a man of 37, seen 27 months ago with sudden onset of diplopia, vertigo and a spastic right arm with partial speech block. Spinal fluid entirely normal except increased protein. Symptoms persisted ten days He was given intravenous histamine initially and had a recession of symptoms. He was later shown to be tobacco and pork sensitive He has had no relapses although the right arm is slightly spastic. Cerebellar and optic function remained normal until four months ago when he resumed smoking and within a week's time had a mild but definite recurrence of vertigo. This cleared in three days after tobacco was stopped. Recently, a single ingestion of shell-fish caused mild urticaria but no neurological signs.

Case 3, L. M., followed 19 months, a male, age 33, had a sudden onset four years ago of spasticity in the left limb with angioneurotic edema of face and diplopia. The original diagnosis, as made elsewhere at that time, was polio, but a spastic state persisted in the left limb and he had recurrences of marked vertigo and diplopia for the years indicated. Two years ago his condition was diagnosed multiple sclerosis in a good clinic elsewhere. This man, judging by skin tests, is sensitized to alternaria and hormodendrum and also timothy. He is sensitive to tobacco by pulse response and to vegetable oils by the same method. He was hyposensitized to the molds and grass pollen. He avoided tobacco and vegetable oils (Spry, Crisco, etc.) and since that time has had only one recurrence of diplopia with periorbital edema, and that occurred in the timothy pollination season when he was putting up hay. Otherwise he remains free of nystagmus He suffers diarrhea when ingesting the vegetable oils.

Case Observed by *Alan Johnston*

Case, B. S, female 35; diagnosis multiple sclerosis had been made elsewhere eighteen months previous to the first consultation. For the preceding four months, B S. had been able to walk or stand with support only. Two weeks after elimination of smoking and cane-sugar, both of which caused a tachycardia, this patient was able to walk five blocks to town and return—without support At the end of six weeks she was able to handle pliers and screwdriver to assemble daughter's doll-house—tools she hadn't been able to use for a year By this time, she had been found sensitive to potatoes, beef, eggs and tomatoes and had gained nine pounds to 144 (height five feet, six inches)—the most she had ever weighed. At the end of the second month, she drove 300 miles in a day and a half and felt fine doing it.

Case Observed by *A. F. Coca*

A. M. (male), age 40; 5 ft. 11¼ inches, weight 147 lbs., right handed, had been examined from March 23, 1949, at the Neurological Institute in New York with a "history of intermittent episodes of weakness of the left lower extremity since August, 1946 There has been some slurring of speech in the last two months.

"Examination revealed very slight weakness of the left upper and lower extremities, overactive deep tendon reflexes on the left, absent abdominal and cremasteric reflexes, nystagmus in all gazes and temporal pallor bilaterally. The routine laboratory finding was essentially normal, including spinal fluid, x-ray of skull and entire spine, and electroencephalogram. We felt that the diagnosis in this case was multiple sclerosis"

A. M. reported to me the following common food-allergic symptoms: heartburn, constipation, abnormal tiredness. His right hand shakes when he writes. He is a daily cigarette chain-smoker.

Table XLV presents the pulse record of A. M. for seven days from the evening of the first consultation.

1949

June 5. Constipation gone; eyes do not "dance" so much.

June 6. Hanging window screens; on feet all morning.

June 7. Making window screens; speech improving.

June 8. Walked a mile; left leg tired.

June 10. Body-balance improving; skin color growing pink. Since yesterday sudden movements of head (up, down and sideways) have not caused any "dancing" of eyes; occasional numb spot on left hip when he lies on it. Weight 150 lbs.

June 20. Left leg not so weak as it has been.

Aug. 2. Sneezing; stuffy nose increasing since July 29; constipation has returned.

Aug. 26. Speech normal, eyes dance; still sneezing and nose stuffy; left leg weak. Color excellent; weight 168 lbs.

Dec. 18. A. M. came to my house discouraged. Weight 170 lbs. In general feels better than formerly. "No tightness of head." But he is still constipated and has a "stuffy nose which is more marked when he is in bed." Complained of "pain in the back."
In one hour after arriving in my Dust-Sealed home one side of his completely closed nostrils became clear. Pulse = 84; he finds it frequently 80 or more. I gave him one pound of Dust-Seal, which he applied the next day.

1950

Jan. 26. Visited A. M. finding him engaged in scraping paint off wood-work of the living-room floor, preparing for varnishing (not allergic to paint fumes). Immediately after he had Dust-Sealed his bed-mattress, in December, his nose cleared; his pulse does not rise above 68 and the "pain in his back" has lessened.
Weight is still 170; color good, speech and eyes normal; still slightly constipated; limps slightly.
Expects to take a job in a few weeks.
Says he is beginning to forget he was ever "sick." Sleeps well through the night; never gets tired.
A few days after this visit he thoroughly Dust-Sealed all his upholstered furniture.

Feb. 17. Visited A. M.: No longer constipated; pain in back gone.

May 10. A. M. works with plastic material; men smoke; he comes home tired; recovers soon after lying down.

June 4. Working harder; on his feet all day; sometimes drives a truck; less tired now, but pulse is usually above his normal maximum (tobacco smoke?). Tests of a wide variety of foods in A. M. have revealed no food allergens excepting certain unusual spices in a particular sausage which he has avoided. The pulse was stabilized from the fifth day,

but clinical improvement had been apparent to the patient from the third day.

Noteworthy features of this case are.

1. The principal sensitivity to tobacco
2 The persistence of the effect of tobacco on the pulse for several days after avoidance.
3 The nonspecific protection against the minor dust-sensitivity which lasted for two months after avoidance of the stronger tobacco allergen.
4. The mechanical protection against the mattress-dust and furniture-dust through the use of Dust-Seal, as evidenced by prompt disappearance of the residual symptoms—rhinitis, constipation, pain in the back.

TABLE XLV

Pulse of A. M. (multiple sclerosis) through seven days after discontinuance of smoking

May 28	29	30	31	June 1	2	3
B.R.—	68	60	60	60	60	60
B.	84	72	68	68	68	64
30'	88	72	76	72	68	68
60'	84	72	68	68	68	68
90'	84	72	68	68	68	68
			"a good day"	walks downstairs without holding railing No weakness in left arm, writing steady	still some weakness in left leg	
Lunch	84	68	68	68	68	68
30'	84	76	72	73	68	68
60' stopped	84	68	68	65	68	68
90' smoking	84	72	68	68	68	68
	Two inhaled puffs from cigarette 0 = 84 5' = 92	"Legs feel better"		"speech much less slurred"		
Dinner 84	72	68	68	68	68	68
30' 84	76	76	72	72	68	68
60' 84	72	68	72	69	68	68
90' 84	72	68	68	68	68	68
					"played ball with son, previously could not stand up with bat"	weight 147 lbs
Ret. 84	72	68	68	68	68	68

Note Pulse stabilized 60-68.

DISCUSSION

All of these five histories represent essentially accounts of experiments conducted by three independent observers for the purpose of determining whether or not multiple sclerosis is an idioblaptic manifestation. Examining the histories we find:

1. That improvement began in all of the cases soon after avoidance of the pulse-accelerating foods.
2. That in three cases, *subsequent exposure to pulse-accelerating allergens* was promptly followed by a return of symptoms, which again disappeared upon avoidance; in one other case exposure to pollens was followed by brief recurrence.

In two cases the symptoms of recurring multiple sclerosis were accompanied with other idioblaptic symptoms—constipation, chronic rhinitis, migraine.

In the face of this clear proof of the allergic nature of the disease in the observed cases, the conventional "five years" period of probationary delay in the extended use of the preventive "treatment" would seem an unjustified excess of conservatism.

The evidence suggests that multiple sclerosis is curable through the simple stabilization of the pulse by avoidance of pulse-accelerating allergens.

References

1. Read before Conference on *Allergy*, N. Y. Acad. Sciences, Apr. 26, 1947. (See *Ann. New York Acad. Sc.*, *50*:773–795, Dec. 26, 1949.)
2. Meyer, M. G.: *Ann. Allergy*, *6*:417–427, July–August, 1948.

Addendum

The following note was submitted by Dr. Milo G. Meyer on June 1, 1951, for inclusion in this chapter:

"I have now followed 13 cases of multiple sclerosis closely for at least one year.

"*Four of them have been under close observation for at least five years.* Of these four, three are perfectly controlled and show only the residual of the presenting symptoms. Two are food-sensitized alone; one has a timothy and tobacco sensitivity along with his food allergens; the fourth has multiple food-sensitivity and environmental sensitivity which I have not yet been able to control. She is having slow progression of her symptoms and has had intravenous histamine and intramuscular curare on numerous occasions to keep her ambulatory.

"*Four others have been followed three years.* Three have had intravenous histamine in addition to removal of sensitizing food with subsequent stabilization of the pulse. All have remained in a remission for three years. The fourth has been controlled on food elimination alone and has remained in a remittance.

"*The remaining five have been followed a minimum of 14 months.* Three continue completely free from progress of the illness and all three have had intravenous histamine in addition to certain food and tobacco elimination. The other two have had stabilization of the pulse on tobacco-avoidance and avoidance of only one or two sensitizing foods.

"The percentage remaining in remission is, thus, far greater than it is of those who show a natural tendency to remit without treatment; and the time of observation is now beginning to be long enough to warrant drawing the definite conclusion that there is an allergic etiology in multiple sclerosis."

CHAPTER XXVI

*Concerning the Special Problems of Idioblaptic Disease as It Affects Women**

BY

ALAN JOHNSTON, M.D., Plainfield, Ind. AND
ARTHUR F. COCA, M.D., Oradell, N. J.

THIS COMMUNICATION does not pretend to exhaust the subject; it is rather of the nature of a preliminary report. Having each of us learned of the remarkably different, independent observations of the other, and realizing the advantage of their joint presentation for the interested reader, we decided to pool our data.

Our observations indicate that human idioblaptic disease differs in two respects in the two sexes: 1) as to the symptoms and 2) as to the allergic excitants.

ad 1) In almost all instances idioblaptic symptomatology differs in women from that in men only in so far as it affects the generative and lacteal functions of the former. This difference is illustrated in cases C6, C9 and J1–12.

ad 2) It is to be noted that the allergic excitants of all of those symptoms that are peculiar to women are of external provenance, indeed they are the same as those which excite the allergic symp*toms that are common to the two sexes—foods, inhalants, etc.*

On the other hand, the allergic excitant which is peculiar to women is itself a recurring product of the cycle of ovulation that we conveniently refer to as the "menstrual allergen," although it

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appears also to be the possible specific cause of allergic symptoms that persist in some women in the early months of pregnancy. The allergic symptoms that are excited by the internal menstrual allergen are not those peculiar to women; they are those which are common to the two sexes—headache, asthma, constipation, tiredness, epileptic seizures, eczema, etc. The cases illustrating the specific sensitivity to the menstrual allergens are C1, C2, C3, C4, C5, C7 and C8.

Case Reports by Alan Johnston

Case J1: Mrs. K. B., age 34, nausea and vomiting of pregnancy, and heartburn, severe. First seen by me when she was eleven weeks pregnant; poorly controlled by vitamin B_1 and B_6, antacids, and hypnotics and with $8^1/_2$ pounds weight loss. History revealed no serious illnesses. With a previous pregnancy ($2^1/_2$ years before) nausea, vomiting and heartburn had persisted to term in spite of the usual medications, and generalized swelling had necessitated removal of rings from the fingers at the fifth month. The first labor was difficult and 34 hours long. The baby was born naturally. Mrs. K. B. was unable to nurse the child. When first seen with this second pregnancy she was taking B_1 and B_6 daily and using sodium amytal, grains 3 "p.r.n." A food survey was extended over several days due to interruptions from vomiting and need for medication. The pulse record during the test is shown in Table XLVI. It is seen that some foods causing the pulse to exceed 88 were not restricted. The reason for this was that experience with the pulse behavior during pregnancy was lacking and it was felt that initially only the foods causing the greatest tachycardia should be removed.

Accordingly oats, potatoes, carrots, and beef were suspected. By this time the patient was vomiting and the milk check was postponed. Two days later tests were resumed with results shown in the chart. Reviewing this record it appeared that 88 was a reasonable limit for the pulse in this case so corn, potatoes (second check), parsnips, rice, milk, and chocolate were removed from the diet. The 92 count on tea with sugar was felt possibly due to the preceding rice so sugar was not removed. Fish was eaten without a pulse check and did not produce symptoms. Following removal of the suspected foods the nausea, vomiting, and heartburn disappeared. The patient stated her headaches and constipation also cleared—these were so common with her that she had accepted them as a part of her life and had not mentioned them. She also stated she had had with this pregnancy a craving for carrots, beef, and potatoes and that carrots had been eaten with almost every meal. Two weeks following elimination of the foods Mrs. K. B. stated she felt better than she had before she became pregnant.

Seven weeks after elimination of the foods producing a tachycardia a single ingestion of beef produced a "terrific indigestion." A few days later a single ingestion of carrots caused vomiting and later still the ingestion of peas that had been cooked in the pot with carrots caused vomiting. Mrs. K. B. ate sparingly of potatoes in spite of the tachycardia produced. By the fifth month (at which

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this entire interval the mother avoided milk (except in bread), beef, carrots, rice, chocolate, parsnips, and ate sparingly only of potatoes.

The record of the food survey, repeated after weaning the baby is included, Table XLVII, to show the continued influence of the foods on the pulse, to reveal celery sensitivity, and to show the general pulse level.

Case 12: Mrs. R. B., age 32. Inability to nurse baby—infant six weeks old taking four ounces of supplement with each breast feeding; breast-milk colorless; infant hypertonic and fretful. First two children had been artificially fed, the third had the breast for four months with continuous supplement. Three days after a restricted intake of food (tea, sugar, rice, beef, grapefruit, salt,

TABLE XLVII

	Pulse						
	Before Rising	Before Eating	30 Min. After	60 Min After	90 Min After	At Bed-time	
Breakfast	70	79	79	79	79	—	Oats
10 A M	—	79	80	79	79	—	Orange
Lunch	—	79	78	78	78	—	Potatoes
2 P M.	—	78	78	78	79	—	Peas
Dinner	—	79	79	79	79	—	Beef
8 P M.	—	79	79	79	79	79	Milk
Breakfast	70	80	82	80	78	—	Wheat
10 A M	—	76	76	74	72	—	Grapefruit
Lunch	—	79	79	76	74	—	Egg
2 P.M.	—	79	79	76	76	—	Cabbage
Dinner	—	79	81	76	76	74	Pork
8 P M.	—						—
Breakfast	70	76	79	78	76	—	Cornmeal mush
10 A M.	—	73	77	77	76	—	Tomatoes
Lunch	—	76	77	77	76	—	Cabbage, beans, corn
2 P.M	—	76	84	84	82	—	Celery
Breakfast	70	78	84	82	78	—	Rice
Lunch	—	79	79	78	78	—	Fish
2 P M	—	79	89	88	88	—	Carrots

cabbage) the milk showed a definite improvement in color. A food survey was instituted (Table XLVIII) and *milk*, grapefruit, orange, and banana eliminated. Three days later the supplement was dispensed with and the baby was contented The baby was weaned at eight months at which age it weighed 18 pounds. Solids and breast were given three times a day from the fifth month on. In retrospect, bowel movements of the mother became adequate and of good caliber and easily expelled as opposed to pencil-like stools requiring forceful expulsion and with the *feeling* of incompleteness over preceding years; two daily naps which had been needed previously were omitted unconsciously and not missed; skin lesions covering the entire body occurring in May and June of the preceding two years (appearing as ivy poisoning initially and flaring up to involve the skin over the entire body on usual treatment injection—but responding perfectly to very dilute and graduated doses up to 0 07 cc of a 1:50,000 dilu-

time with the first pregnancy she had continued to have nausea, vomiting, and heartburn and had to remove her rings), with this second pregnancy she felt as well as she had ever felt in her life and her bowel movements were better than she remembered their ever being. With the exception of heartburn at night during the last six weeks of pregnancy (of less severity if potatoes were not eaten) the remainder of the pregnancy was accompanied by continued good feeling—a recheck *post partum* for weight showed a tachycardia with celery, botanically related to carrots; and in retrospect Mrs. K. B. stated she had eaten celery almost nightly during the latter weeks of pregnancy.

TABLE XLVI

	Pulse: Before Rising	Before Eating	30 Min. After	60 Min. After	90 Min. After	At Bed-time	
Breakfast	88	90	95	95	98	—	Oats
10 A.M.	—	87	88	88	88	—	Orange
Lunch	—	88	95	96	96	—	Potatoes
2 P.M.	—	90	94	96	105	—	Carrot
Dinner	—	101	94	96	101	—	Beef
Breakfast	82	79	93	93	85	—	Cornmeal mush
10 A.M.	—	82	90	85	84	—	Grapefruit
Lunch	—	82	85	87	87	—	Eggs
2 P.M.	—	87	87	82	82	—	Peas
4 P.M.	—	83	93	87	87	—	Milk
Dinner	—	88	87	86	84	—	Pork
8 P.M.	—	84	83	83	82	82	Tea, sugar
Breakfast	82	85	87	87	87	—	Wheat
10 A.M.	—	87	88	88	86	—	Apples
Lunch	—	87	90	90	89	—	Potatoes
2 P.M.	—	89	99	—	—	—	Parsnips
Dinner	—	84	88	86	86	—	Fish, peas, orange, tea
8 P.M.	—	87	84	82	—	87	Nescafe
Breakfast	80	87	101	98	92	—	Rice
10 A.M.	—	86	96	93	90	—	Chocolate—sugar
Breakfast	82	88	90	90	90	—	Rice
10 A.M.	—	90	92	84	84	—	Tea, sugar

The labor terminating the second pregnancy lasted 1¼ hours from awakening with the first pain to precipitate delivery (due to inability to extend anesthesia quickly enough, the patient having been removed directly from the ambulance stretcher to the delivery table). A second degree tear was repaired and the patient put to bed with the restricted diet ordered continued. She had a spontaneous bowel movement on the third day *post partum* and left the hospital on the fifth day. The baby's weight was 6 lbs 12 oz, and on leaving the hospital 7 lbs 9 oz—on breast alone. The baby slept through the night without feeding from the sixth day on; otherwise was on a four-hour schedule. Mrs. K. B. avowed the first time she heard the baby cry was at four months when pertussis immunization was started. The baby was weaned at nine months. During

tomatoes and of severe poison ivy dermatitis every summer in spite of avoidance of contact Severe headache would follow mangoes and occur with the menses, mild headaches occur one time weekly. This patient would often awaken from her sleep "gasping for breath." A food survey revealed sensitivity to potatoes, eggs, chocolate, grapes, cheese (molds), and pimento.

On elimination of these foods complete relief was afforded from the headaches, fatigue, shortness of breath, dysmenorrhea, neuralgic pains, angioneurotic edema, and she has had no further episodes of awakening "gasping for breath."

Difficulty was encountered in establishing a basal pulse for Mrs. N. S. This was revealed to be due to a sensitivity to some factor in newspaper or newspaper ink Her husband worked for a newspaper in the printshop, on the night shift. The retiring pulse for Mrs N. S. was lower than the before-arising pulse and plastic covers for the pillows and mattress did not alter this, nor was the pulse elevated following a nap during the daytime. Cosmetics did not produce a tachycardia. However, this patient noted that when her husband came home (about 3.00 A.M) her pulse was lower than on retiring and also lower than before arising. She also observed that her pulse increased while reading a newspaper but not while reading a book or magazine

It is of interest that Mrs. N. S. in the three years following the dietary survey has had no poison ivy dermatitis though she has deliberately handled the plant. She has had but two mild colds—each following ingestion of the allergenic foods when there was also exposure of unusual degree Similar exposure at other times has produced no colds.

Case 15: Mrs V H, age 40. Headaches in the past four years severe, average of four times weekly—awakens with them and present all day, occasionally last *for several* weeks without letup. Constant fatigue, nausea and vomiting three to four times weekly in the preceding two years, not associated with the headaches Insomnia, with constant need for barbiturates for six years Severe dysmenorrhea, and scant menses of one day duration. History of headaches intermittently all her life. A food survey was undertaken but was not successful on the first attempt, as Mrs. V. H. stayed in bed for the two days of initial testing and there was very little fluctuation in the pulse (orange, potato showed up of questionable tolerance, a tachycardia of 9 and 10, while other foods tested were followed by a rise of no more than 5—milk produced a rise of 7). Avoidance of these three foods gave some better feeling but not enough. The foods were then rechecked when she was up and about the house throughout the tests This second testing revealed a tachycardia following pork, orange, potato, and wheat (a pulse increase of 12 or more, whereas other foods produced a rise only to 8) and no tachycardia following milk. A test for tobacco produced a marked rise—16 in five minutes—but Mrs. V H would not forego smoking. She did, however, reduce the number of cigarettes smoked daily from 20 or more to 4. Following avoidance of the *above foods* and reduction in tobacco consumption the headaches, nausea, vomiting, fatigue and insomnia disappeared and barbiturates were dispensed with. Six successive menses were without pain or cramps and were of four days' duration with moderate flow.

Mrs. V. H. *worked in* an office and had to eat two meals out daily. She found it impossible always to avoid the allergenic foods Their ingestion in even small quantities would produce headaches and occasionally nausea and vomiting. The use of 25 mg of tagathen (Lederle) before and three or four hours following

tion of extract) has not reoccurred in subsequent two years of dietary control in spite of definite exposure to ivy. Strawberries caused an itching of the skin the first May following removal of the foods and were eliminated without a pulse record.

Case J3: Mrs. G. G., age 50. Hives of four years' duration, difficult climacteric, persistent cough, pains low back and down back of thighs and calves, loss of weight, insomnia, and constipation. *No days free of hives in four years.* Previous allergic workup revealed skin sensitivity to beef only (shortly after onset of hives). Avoidance of beef; theelin, histamine and vitamin shots weekly; sedative, hypnotic, tonic and vitamins daily without relief (no apparent aggravation). Elimination of foods causing a tachycardia (corn, grapefruit, and egg) brought improvement—within two weeks had intervals of three days without

TABLE XLVIII

	Pulse						
	Before Rising	Before Eating	30 Min. After	60 Min After	90 Min. After	At Bed time	
Breakfast	59	66	69	63	63	—	Oats
10 A.M.	—	71	86	70	69	—	Grapefruit
Lunch	—	70	71	65	67	—	Potatoes
2 P.M	—	72	64	63	74	—	Carrots
Dinner	—	73	73	85	82	—	Bananas
8 P.M.	—	82	81	72	72	—	Beef
Breakfast	73	88	97	95	94	—	Oats, milk
10 A.M.	—	94	92	92	94	—	Coffee, sugar, oats
Lunch	—	79	83	80	78	—	Potatoes, eggs
2 P.M.	—	79	92	84	76	—	Orange
Dinner	—	78	—	—	—	—	Beef, potatoes, carrots
Breakfast	70	70	74	76	—	—	Oats, coffee, sugar, egg
Lunch	—	73	73	75	76	—	Wheat, coffee, sugar
	—	76	—	—	—	—	Bread
Dinner	—	63	67	68	68	—	Eggs, potatoes, carrots
Breakfast	76	83	79	81	72	—	Eggs, oats, coffee
10 A M	—	72	73	73	—	—	Bread

hives. Subsequently tomatoes removed by Mrs. G. G on basis of recurring hives—and without pulse record. Beef checked on three occasions without a tachycardia and hence added to the diet—without producing hives. With elimination of the foods the hot flashes and the nervousness disappeared immediately as did the cough, pains, insomnia and constipation. She has had no further estrogen treatment. Mrs. G. G. gained four pounds (she had lost 12 pounds) and has stayed symptom-free for three years

Case J4: Mrs. N. S., age 41. Headaches, fatigue, alternating diarrhea and constipation, excessive gas, dysmenorrhea, neuralgic pains in right leg (history of old injury), *dyspnea following* meals frequently, angioneurotic edema. History of infantile eczema, frequent colds, of hives with bananas, strawberries and

cycle. A food survey was conducted and a relative tachycardia developed following wheat, corn, and peas. These foods and beans were eliminated from the diet. The second period following avoidance of these foods began 35 days following the first day of the preceding period. Subsequent periods recurred at 27-day intervals for eight months. The perennial rhinitis disappeared and Mrs M. V. felt more energetic, good on arising, less nervous and of "much better disposition"

After eight menses without impregnation etamon chloride was given Mrs. M. V. on the eleventh day of the cycle. Pregnancy ensued. Etamon was used as it was felt there were more allergens present but that Mrs. M. V. was not a good candidate for further testing Experience had shown that etamon was useful in temporarily counteracting some of the pathology of food allergy.

Mrs M V. carried the pregnancy to term in a normal manner and nursed the baby until it was seven months old. She continued throughout this interval and to the present time (baby is 15 months) with avoidance of the listed foods. She is still asymptomatic with respect to the rhinitis, fatiguability, menstrual frequency, and nervousness

Case J9: Mrs. V. R., age 24. Nausea and vomiting of pregnancy for second and third month, moderately severe and without letup. A survey by the pulse method of study revealed no sensitivity to nine of the more commonly eaten foods. Tobacco caused a marked tachycardia · before smoking 80, five minutes after smoking 92, 10 minutes after smoking 86, and 15 minutes after, 83. Mrs. V. R. smoked 15 to 20 cigarettes daily. After elimination of tobacco the nausea and vomiting disappeared without return. Heartburn occurred, however, from time to time, which the patient felt was due to spices (not checked). Mrs. V. R. nursed her baby for nine months. In retrospect she stated she had had transient episodes of frequent headaches which disappeared when she stopped smoking

Mrs V R. has three married sisters, all of whom have been troubled with nausea and vomiting of pregnancy, and who had miscarried with their first pregnancies

Case J10· Mrs M S., age 29 Indigestion with much gas, abnormal hunger, occasional headache, fatigue, dizziness, absence of sexual drive (states had never had it and had never an orgasm, nor found any pleasure with intercourse—has two children). Shortness of breath and frequent episodes continuous nagging pain with occasional superimposed knife-like pain to left of sternum and in upper right chest. Had been investigated in past for rheumatic fever, gall bladder trouble and gastric ulcer. General medical and hormonal attention had failed to provide relief for above A year of psychiatric consultation in the preceding two years had given better general feeling (acceptance or insight) but had not altered the sexual disinterest. Dysmenorrhea was a regular occurrence until the second child was born seven years previously. She was unable to nurse the second child. Had not been troubled with nausea and vomiting of pregnancy.

A survey was conducted and sensitivity found to egg, wheat, pork, banana, grapefruit, and tobacco—these producing a tachycardia. Elimination of these foods and tobacco resulted in relief from above mentioned complaints with arousing of sexual drive. However, Mrs. M. S. stated she could not obtain a "climax." Reinstitution of estrogen and testosterone therapy, as outlined by

their ingestion would prevent the development of the headache and of other symptoms—providing that only small quantities were eaten (if more than one were eaten) or that only one was eaten in moderate quantity.

Case J6: Mrs. D. S., age 30. Dysmenorrhea with mental depression following periods; Mittelschmerz every other period; recurrent bouts of pain over right kidney and pyuria; epigastric pains following meals; headaches. The dysmenorrhea, mental depression, and Mittelschmerz were relieved by antihistaminics given for four days preceding the expected time of flow and continuing through the period and each second month given from the ninth through the twelfth days (pyribenzamine, Ciba, at first and later histadyl, Lilly). A food survey was undertaken after a few months and avoidance of foods causing a tachycardia (wheat, oranges, potatoes, grapefruit, rice, and oats) gave relief for all of the above complaints. However, Mrs. D. S. found it difficult to avoid the foods completely and antihistaminics were reinstituted and a moderate amount of wheat permitted in the diet. This gave adequate relief.

Mrs. D. S. had undergone cystoscopy with drainage and irrigation of the right kidney pelvis at six-month intervals for the preceding two years. Pyelography had shown a right hydronephrosis. The complaints that prompted attention to the right kidney recurred twice in the following twenty-four months of attention to the diet, and each time they followed prolonged dietary indiscretion and were relieved by strict adherence to the diet for but a few days.

Case J7: Mrs. B. S., age 35. Relative sterility eight years' duration; frigidity two years; multiple sclerosis, diagnosed 18 months previously by neurologist. School teacher with one child, age 12 years. For preceding four months had been able to walk or stand with difficulty only. Two weeks after elimination of smoking, peaches, potatoes, beans, peas, corn, and cane-sugar, all of which caused a tachycardia, this patient was able to walk five blocks and return—without support. In the succeeding two weeks beef and eggs were eliminated. Tomato was eliminated on an unrecorded count. At the end of six weeks she was able to handle pliers and screwdriver to assemble daughter's dollhouse—tools she hadn't been able to use for a year. From the second week through the second month Mrs. B. S. ate only coffee, bread, wheat products, dairy products, pork, cabbage family, grapefruit, asparagus, spinach. At the end of the second month she drove 300 miles in a day and a half and felt fine doing it. The succeeding five weeks were complicated by the return of an old pyelitis accompanied by a relapse in the improved ability to use the arms and legs. At the end of the fifth month the patient stated she was four weeks overdue for her menses. The Friedman test was positive. It was then revealed that for six years prior to the onset of the subjective symptoms of multiple sclerosis she had been unable to get pregnant, though a second child was desired by her and her husband. For the past two years she had had no interest in sexual activities. Her husband left her shortly after the onset of subjective symptoms of multiple sclerosis, though he returned at intervals to visit. The husband visited her prior to the missed periods (two weeks) at which time she was quite responsive to him and following this single exposure (first in two years) she became pregnant. Subsequent to this, the patient elected to consult another doctor.

Case J8: Mrs. M. V., age 35. Relative sterility for eight years of marriage (no contraceptives used)—menstrual frequency, perennial rhinitis. For ten months menses occurred each 21 days as compared with her former 27-day

cycle A food survey was conducted and a relative tachycardia developed following wheat, corn, and peas. These foods and beans were eliminated from the diet The second period following avoidance of these foods began 35 days following the first day of the preceding period. Subsequent periods recurred at 27-day intervals for eight months The perennial rhinitis disappeared and Mrs. M. V. felt more energetic, good on arising, less nervous and of "much better disposition."

After eight menses without impregnation etamon chloride was given Mrs. M. V. on the eleventh day of the cycle. Pregnancy ensued. Etamon was used as it was felt there were more allergens present but that Mrs. M. V. was not a good candidate for further testing. Experience had shown that etamon was useful in temporarily counteracting some of the pathology of food allergy.

Mrs M. V. carried the pregnancy to term in a normal manner and nursed the baby until it was seven months old. She continued throughout this interval and to the present time (baby is 15 months) with avoidance of the listed foods. She is still asymptomatic with respect to the rhinitis, fatiguability, menstrual frequency, and nervousness.

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Mrs V. R. has three married sisters, all of whom have been troubled with nausea and vomiting of pregnancy, and who had miscarried with their first pregnancies.

Case J10: Mrs M. S., age 29 Indigestion with much gas, abnormal hunger, occasional headache, fatigue, dizziness, absence of sexual drive (states had never had it and had never an orgasm, nor found any pleasure with intercourse—has two children). Shortness of breath and frequent episodes continuous nagging pain with occasional superimposed knife-like pain to left of sternum and in upper right chest Had been investigated in past for rheumatic fever, gall bladder trouble and gastric ulcer General medical and hormonal attention had failed to provide relief for above. A year of psychiatric consultation in the preceding two years had given better general feeling (acceptance or insight) but had not altered the sexual disinterest. Dysmenorrhea was a regular occurrence until the second child was born seven years previously. She was unable to nurse the second child. Had not been troubled with nausea and vomiting of pregnancy

A survey was conducted and sensitivity found to egg, wheat, pork, banana, grapefruit, and tobacco—these producing a tachycardia Elimination of these foods and tobacco resulted in relief from above mentioned complaints with arousing of sexual drive However, Mrs M S stated she could not obtain a "climax." Reinstitution of estrogen and testosterone therapy, as outlined by

the psychiatrist previously, in association with the dietary and smoking restrictions resulted in repeated attaining of the "climax." After two months of "normal" sexual reactions Mrs. M. S. and family left home for a two weeks' vacation. While on vacation it was not practical to avoid the allergenic foods completely and there reoccurred the fatigue, indigestion, chest pains, shortness of breath and loss of sexual interest. Hormone therapy was continued throughout. On returning home the diet was again rigidly followed with cessation of all the complaints within a period of two weeks.

Case J11: Mrs. L. F., age 28. Inability to nurse child. Baby nursed for seven weeks with adequate weight gain but with a three-hour schedule during the day and a four-hour schedule during the night, and with much crying beginning two to 2$^1/_2$ hours after feeding. Mrs. L. F. stated her breasts did not fill up soon enough. A food survey was undertaken and five foods produced a tachycardia. Elimination of these five: beef, milk, orange, grapefruit, and potatoes resulted in a contented baby on a four-hour schedule that would sleep six to eight hours during the night without awakening.

Mrs. L. F. had no trouble with nausea and vomiting with her two pregnancies and she gave no history of menstrual irregularity or dysmenorrhea.

Case J12: Miss E. M., age 24. Endometriosis, postoperative, with obstructive phenomenon; ovarian deficiency; continuous neuralgia and stiffness on left side of the neck for several years; insomnia, nervousness, with intervals of depression. Operation in 1944 for appendicitis. Findings were chocolate cysts both ovaries, endometriosis widespread through pelvis. The left ovary and part of the right ovary were removed. Subsequent to surgery recurring episodes of severe pain in the lower right quadrant requiring hospitalization with codeine and at times morphine for relief. Episodes would last few days to a week. Severe depression and hot flashes developed following surgery necessitating hormonal therapy. These episodes of pain became more intense and when first seen by me Miss E. M. had had continuous pain of severe degree for about five weeks. Numerous g.i. series and flat plate x-rays of the abdomen were negative during the five years following surgery. Hospitalized in 1948 for nausea and vomiting. Following this, further gynecological consultation resulted in the following recommendations: 1) x-ray therapy to right ovary and pelvis; 2) increase estrogens for better control of hot flashes and depression; 3) exploratory laparotomy. Estrogen therapy had been maintained at a minimum following surgery to maintain a lowered stimulus for endometrial proliferation. Further gynecological consultation added nothing. A food survey was instituted and tachycardia followed ingestion of beef, chocolate, milk, and eggs; these foods were eliminated from the diet. With avoidance of these foods the lower-right-quadrant pain has disappeared entirely but recurs when beef is eaten—it is not caused by the other foods. The neuralgic pain and stiffness of the neck has disappeared and recurs with chocolate only, and not with beef. The insomnia, depression, and nervousness have greatly improved. The hot flashes are now controlled completely by estrogens at weekly intervals with no lower-right-quadrant pain. Preceding the food survey this patient had taken estrogen injections daily for periods of two weeks to a month with less benefit for the depression, flashes, and nervousness than has been attained with the weekly injection following avoidance of the four allergenic foods. Carrots, beans, peas and oranges also produce a relative tachycardia but may be eaten sparingly.

Case Reports by Arthur F. Coca

Case C1: Mrs. K., age 34, subject to migraine headache occurring at frequent intervals but more severe at the menstrual periods. Only one class of food (citrus fruit) caused acceleration of the pulse, which previous to treatment ranged from 56 to 94. Upon avoidance of all citrus fruit there were no further attacks between the periods, but severe periodic attacks continued, accompanied with relative tachycardia—up to 84. The normal interperiodic rate ranges from 60 to 68

The following table shows the pulse record of the patient through a menstrual period on a general diet, which excluded citrus fruit. The pulse-accelerating effect of the menstrual allergen is apparent three days before the flow began and this effect is seen to continue one day after the flow ended. The constancy of the daily normal maximal rate is illustrated in the records of the last three days. The record was continued for another six days in which the maximal daily count remained 68, the daily minimum being either 60 or 62.

PULSE RECORD OF MRS. K. THROUGH 12 DAYS BEGINNING THREE DAYS BEFORE THE MENSTRUAL FLOW

Pulse Counts Taken Just Before and One Hour After Each Meal, Just Before Rising and Just Before Retiring

September, 1941 18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th
64	60	62	64	64	60	62	60	62	60	60
62	58	60	60	60	64	60	62	62	64	62
60	80	64	64	66	64	64	64	64	64	64
60	76	66	70	68	66	64	62	62	62	64
66	78	70	74	70	70	70	66	66	66	68
68	76	66	84	66	68	64	70	68	68	66
70	80	68	80	68	70	66	66	64	66	68
74	64	68	78	66	66	66	64	64	64	64
	N.	P B	*H.*	H	h.	P.E. n h.				

N. = nausea; P.B = period begins, *H* = severe headache; H. = headache; h. = mild headache, P E. = period ends, n.h = no headache.

Case C2 Mrs M, age 40, mother of two young children, both allergic, is a sufferer, since early childhood, from attacks of bronchial asthma, which occurred at long intervals (e g, 1923, 1929, 1940). Early cutaneous tests were said to be positive only with cheese and feathers However, cheese can be eaten without symptom and without the slightest effect upon the pulse, and the asthmatic attacks have had no relation to exposure to feathers. Mild asthma and spells of sneezing occur as a rule in the fall earlier or later in different years. Tagathen (Lederle) controls the sneezing promptly but not the asthma. Skin tests with, and inhalations of (Wodehouse) extracts of ragweed pollen cause no local reaction nor any effect on the pulse. Scratch test with dust extract (Lederle) was positive (1/4 in. × 2 in).

This patient came to consultation in August, 1946, reporting that at her recent period there had been a severe asthmatic attack lasting two days. At the

September and October periods the attacks were close to status requiring frequent injections of epinephrine through the day and through a whole night, respectively. X-ray sterilization was begun October 25.

There were two periods after the 10 x-ray treatments, both accompanied with high pulse (up to 104), but with milder asthma. Then the periods ceased and also the asthmatic crises and the tachycardia.

Case C3: Mrs. N., *age 43, suffered migraine "at least once a week and always* on the third day of the menstrual period." After the pulse-accelerating foods, tobacco smoke and gasoline fumes had been avoided, the pulse ranged from 76 to 84 and there was no headache till the next period (Oct. 17). Tachycardia (98) appeared on the second day and headache on the third, when she took one tablet of ergotamine tartrate. Within 30 minutes the headache ceased but she had a violent spell of vomiting and "became weepy, depressed, dizzy and sleepy." With the pulse still at 98 she retired, becoming "more depressed." Benadryl had been ineffective in her earlier experience.

With her husband's consent and the approval of other local physicians the patient decided to terminate her menstrual periods.

The ten x-ray treatments began November 1. The next period began November 10 and the usual headache began at 7 P.M. November 13, but became "suddenly better" at 11 P.M. The December period began on the 3rd, and the left-sided headache on the 4th, with a pulse of 100 lasting only a few hours At the time for the January period there was no flow; only flushes and chills and no headache. There have been no further attacks of migraine, but exposure to paint-fumes has caused a different kind of headache with nausea and swelling of the feet. She is no longer susceptible to colds and her blood-pressure dropped from 150/90 before the course to 122/84 on October 30. Marital relations have not been noticeably affected.

Case C4: Mrs. B. C., referred for pulse-dietary diagnosis by Dr. Marion B. Sulzberger who kindly permits me to include the following notes from the records *of her case.*

"Diagnosis, atopic dermatitis; distribution of lesions—neck, face, shoulders, arms, hands. The lower limbs were not involved. Duration of disease 15 years. Age 32, first seen February 9, 1946.

"In 1941 the patient had been hospitalized at Skin and Cancer Hospital where baths of potassium permanganate were given. The condition cleared *completely and she enjoyed a period of freedom lasting two years. X-ray treat*ments had been ineffective.

"Under local treatment with various lotions and ointments, the use of antihistaminic and other drugs as well as repeated x-ray treatments the condition improved markedly at first. Was 'fine' till mid-June when an emotional upset occurred which was followed by a flare-up. Again she improved till November, when *(as usual at this time of year) the condition recurred 'as bad as ever.'* "

At this time she was referred to me, coming for consultation December 3, 1946.

The skin over the external surfaces of the entire length of both arms and wrists was thickened, of a dark red color, fissured and oozing slightly in many places. The patient was unable to lift her hands to her head. The itching was sometimes intense.

When she began the pulse-dietary procedure the patient was in the habit of

applying zinc ointment to the lesions once daily upon arising in the morning. On the first two mornings the before-rising pulse-counts were 64 and 66. Before breakfast the counts were 94 and 96 respectively which drew suspicion to the ointment and caused her to discontinue the applications. On the third morning the pulse did not rise above 82 and the highest count that day was 86. However, in the next three days many counts above 86 were observed with maxima of 93, 96 and 94 respectively suggesting numerous food-sensitivities; and it was decided to use the diagnostic stellate block. This was given by Dr. E. A. Rovenstine December 26 at 12:20 P.M. The severe itching of the widespread lesions ceased at the moment after the injection and the pulse dropped to 60-64. The maximal count in the next two days was 80 excepting immediately after lamb (88) and grapefruit (88, 88, 84; increased itch) were eaten.

Conservative sympathectomy (three lumbar ganglia) was performed December 31st by Doctors Irwin and Miscall.

In the next nine days there was almost no itching and the lesions were nearly healed. From January 10th the eczema recurred becoming soon "as bad as ever." The pulse-counts were frequently above the normal maximum (80) but never above 86 Since the patient during that time and thereafter has avoided her two residual food-allergens the recurrent eczema and the irregular pulse was ascribed to other, presumably minor allergens. The usual inhalant excitants (dust, tobacco, etc) were also avoided and suspicion was then directed to the "menstrual allergen."

The patient's suffering was intense and since she had two children, she and her husband asked for x-ray sterilization as a diagnostic measure. The x-ray series was administered between February 18 and March 6, 1947.

On October 1, 1949, the patient wrote "For two years I have enjoyed living to the utmost; that is up to 2½ weeks ago, when I noticed my neck and arms were breaking out again and beginning to itch This past week the itching became quite severe and lo and behold two days ago I started menstruating again."

The second x-ray series was given between October 5th and 14th. *The first treatments were followed immediately by a decided flare-up of the eczematous lesions,* which slowly subsided. On November 8, 1949, the patient wrote "Each day has brought an improvement; there is still dryness on the back of my neck and my hands are still *very dry* But there are no break-outs or angry looking blemishes I now weigh 148 compared with my 175 after the operation, which doesn't make me feel bad at all."

Case C5: Mrs. L. P., age 25, is subject to abnormal tiredness and constipation. The pulse-dietary survey revealed *only two excitants,* tobacco and the micro-organisms in cheese (yeast, bacteria). She is not allergic to milk. Smoking elevated the pulse from 64 to 80 in five minutes. Avoidance of her allergens was followed by relief of her symptoms between the periods, but both the tiredness and the constipation were present for a few days at or just previous to the periods. She became pregnant and reported that the constipation returned and was continuous while she was in that state, at least until she withdrew from my observation—persistence of the corpus luteum?

Case C6 Mrs S, age 28, subject to "deadly tiredness," fearfulness, constipation and painful, crampy menstruation. There are no food-sensitivities The pulse was accelerated (up to 100) while smoking, and upon the avoidance of tobacco the range of the pulse-rate settled to her normal 70 to 76. There-

upon all of the symptoms mentioned above disappeared, including the dysmenorrhea.

Case C7: Mrs. E. B., age 36, had long suffered from daily nausea and vomiting. Her weight was about 90 pounds, height five feet. The pulse-dietary survey, controlled in correspondence (I have never seen her) revealed sensitivity to a number of important foods: cereals, milk, potato, pork, fish, fowl, canesugar, peanut and banana. Her acute symptoms ceased immediately upon avoidance of all her pulse-accelerating food allergens, and slowly thereafter upon her greatly restricted diet, she gained weight up to 120 pounds. This patient never suffers allergic symptoms at the period, but a menstrual allergic effect is registered upon the pulse-rate. Curiously this effect is not always an acceleration, which is usual, but is sometimes a moderate slowing of the rate. Such a symptomless allergic pulse-reaction is sometimes seen to external allergens.

Case C8: C. W., female, age 25. Major complaint idioblaptic epilepsy since 1937. The pulse-dietary survey in 1942 had failed to reveal any non-allergenic foods, hence the conservative sympathectomy was performed in August, 1942.

In the postoperative pulse-dietary survey the following residual food-allergens were identified: cereals, sugar-cane, potato, fish, cascara and dill-pickle—major seizures followed the ingestion of each of these.

Since these foods were avoided, seizures have continued; but these have been strictly limited to the menstrual periods (one seizure at each period).

Case C9: Mrs. S. M. C., age 53, ht. 6 ft.; wt. 246; symptoms, recurring urticaria, indigestion, heartburn, neuralgia, occasional headache, overweight, disturbing hot flashes of menopause and beginning hypertension. Under the pulse-dietary survey she was found allergic to egg, bacon, plum family, orange (not grapefruit), chocolate and lamb.

Immediately after avoidance of these foods her hot flashes ceased and did not recur. All of the mentioned symptoms also ceased; the overweight was slowly reduced to 232 in one month The blood pressure dropped from 132/88 to 130/76.

Discussion

Idioblaptic Symptoms Peculiar to Women

Dysmenorrhea. This common disturbance was encountered in cases C6, J4, J5 and J6. None of these women had consulted us for the relief of that particular symptom, and its disappearance was as unexpected to all of them as it was gratifying. It is noteworthy that in Case C6 the dysmenorrhea was caused by an inhalant allergen, tobacco.

Nausea and vomiting of pregnancy. This symptom was encountered in two cases: J1 and J9. In both patients it disappeared entirely upon avoidance of the pulse-accelerating allergens—foods in J1 and tobacco in J9. In J1 the symptom recurred promptly on two occasions when a pulse-accelerating food was eaten.

Inability to nurse baby. The three instances of this condition J1, J2 and J11 clearly suggest the idioblaptic influence as a specific cause. It may seem paradoxical to some that the quality of the breast milk of J11 should be so decidedly improved after the mother *avoided* milk and beef.

Relative sterility. This cause of unhappiness in some families was encountered and dramatically corrected in J7 and J8, with antiallergic measures. The same condition was present in case C6. However, the avoidance of tobacco by C6, while it resulted in complete freedom from all her other idioblaptic symptoms, was not followed by a pregnancy. The fault was proved not to lie with the husband.

Disturbance of the climacteric. Three cases, C9, J3 and J12, were experiencing the familiar "hot flashes" of the menopause when the pulse-dietary procedure was instituted. In the first two of these that symptom disappeared and did not recur after the pulse-accelerating foods had been excluded from the diet. In J12 estrogen-injections had been given with not completely satisfactory result. After avoidance of the major food allergens the injections were continued and the hot flashes are entirely controlled. The physiological mechanism of the phenomenon invites study.

Frigidity. Cases J7 and J10 are suggestive of an allergic cause of this condition in women. The question may be weighed whether the sexual disinterest in the two cases was secondary to the other idioblaptic symptoms. However, it should be noted that those same symptoms afflict many women whose urge remains normal. The recurrence of frigidity in J10 upon indulgence in pulse-accelerating foods during her vacation is impressive confirmation of the suggested causal relation of her food-allergy to the condition.

It may be appropriate here to mention two instances of "psychic impotence" in the male. In one of these, the avoidance of tobacco (his only pulse-accelerating allergen) was followed by the prompt return of the sex urge, to the outspoken astonishment and satisfaction of his wife. In the second case the wife reported that when her husband was suffering from his chief allergic symptom (atopic eczema) through a period of years, his previously normal sex-urge was entirely extinguished.

upon all of the symptoms mentioned above disappeared, including the dysmenorrhea.

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three months earlier, excepting once upon exposure to paint-fumes (which also caused nausea and swelling of the feet).

The second test with estradiol was made one month later at 11:30 A.M. The pulse remained within her normal range till 3:30 when it stood at 80. At 4 o'clock it was 88 and thereafter at half hour intervals it was 92, 98, 96, 96, 96, 100, 92, 88, 88. There was slight frontal pain in the evening with most unusual fatigue. On neither occasion of the tests with estradiol was there backache, or leg pains, or bad temper.

Two tests were carried out with two 10 mg buccal tablets of progesterone. On both occasions, about two weeks apart, the tests were made at 10:30 A.M. and the pulse records following them are identical. Mrs. N. felt obliged to explain that she did not notice this identity until the second test was completed. The half-hour counts beginning at 10:30 were 80, 76 (her normal low), 76, 72, 72, 72, 72, 80, 86, 90, 88, 80 at 4:00 P.M.

At the first test there was backache and leg pains from 3:30 till she retired. These symptoms were "like those formerly experienced only at the periods." She also was in a "vile temper" throughout the afternoon and evening, "feeling abused" for no ascertainable reason. *There was no headache at any time.*

At the second test with progesterone there was no backache nor leg pains, and again no headache. But the temper and the abused feeling were present in marked degree.

The same tests were carried out with both estradiol and progesterone in case C2, Mrs. M., with wholly negative result. Mrs. M.'s normal pulse range is 58 to 70. Her pulse remained within that range throughout the day of the two tests with estradiol and the single test with progesterone. The pulse did not fall below its normal low in the test with progesterone as it did in both tests with that hormone in case C3.

Several tentative impressions may be drawn from these preliminary observations:

1. The allergic nature of the reactions of Mrs. N. to the two hormones seems to be indicated by the character of the symptoms, the accompanying tachycardia, and the fact that no such effects occurred after any of the tests with those hormones in Mrs. M.

2. The definite lowering of the pulse that occurred in Mrs. N.

Idioblaptic Excitants Peculiar to Women

The seven histories illustrating the different idioblaptic symptoms that may be caused by sensitivity to the menstrual allergen seem to need no further explanatory comment.

However, additional information has been obtained concerning the possible identity of the menstrual allergen in case C3.

Mrs. N.'s outstanding symptoms at the periods were migraine headache with vomiting regularly appearing on the third day, backache and leg pains, and tachycardia. The object of the investigation was to make tests, by buccal administration, of two hormones, estradiol and progesterone,* and observe whether any of those symptoms appeared. Control tests were first made and later repeated in one case with polythylene glycol wax ("carbowax") tablets, the base employed in the hormone buccal tablets.

In all of the tests two tablets of the test material were allowed to dissolve in the buccal pouch between the cheek and upper molars, and the pulse was counted thereafter at 30 minute intervals for ten hours.

The first test of the carbowax blank tablets had a negative result, the pulse remaining at 78 or 80 (within her normal range of 76 to 84) for two hours, and other symptoms being absent throughout the day. However, the two-hour observation period was not long enough for comparison since the allergic reaction of the hormones was later found to occur after a "quiescent period" of four and one-half to five hours.

At the second test with the blank tablets, the pulse was observed for 10 hours, this time, also with a negative outcome.

Two tests were carried out with estradiol with positive result. Each of the two tablets contained 0.25 mg of pure estradiol. The first test was made at 10 A.M.; the pulse remained at 80 for one and one-half hours, when the counts were discontinued. At 4 P.M., Mrs. N. noticed that her face had been flushed for some time and then found her pulse to be at 90. At 4:30 it was 94, and at 5 P.M.—90, on retiring 86. There was slight headache through the evening. There had been no headache since her last period

* The authors wish to thank the Schering Corporation for the supplies of Progynon Buccal Tablets and Proluton Buccal Tablets used in this investigation.

excitants of idioblapsis to produce specific cutaneous reactions in affected individuals.

On the other hand, certain clinical conclusions of Zondek and Bromberg are confirmed in our own study. They remark, "If it is true that premenstrual dysmenorrhea is connected with endocrine allergy, and in this respect differs from menstrual dysmenorrhea, the existence of a fundamental difference in the genesis of these two conditions must be regarded as probable." These authors found the cutaneous test to be positive in about 70 per cent of the cases of endocrine allergy, but negative in all cases of menstrual dysmenorrhea.

Again, they remark: "Thus, clinical pictures such as pruritus vulvae and various premenstrual disorders may, in part, be ascribed to allergic hypersensitivity to *different* endogenous hormones."

Their "positive" skin reactions to hormones in allergies beginning in the menopause (46 per cent) are not consistent with any theory of endocrine allergy. Such cases invite the pulse-dietary investigation.

Summary

1. Evidence is presented which indicates that idioblaptic allergy in women differs from that in men, as to symptoms, and as to the specific excitants.
   - a) The idioblaptic symptoms that are peculiar to women are menstrual dysmenorrhea, nausea and vomiting of pregnancy, inability to nurse child, relative sterility, disturbance of the climacteric, frigidity. All of these symptoms are caused by exogenous excitants (foods, inhalants, etc.).
   - b) The specific excitants that are peculiar to women are the female sex hormones. These may cause a number of symptoms, which are not peculiar to women, such as migraine, asthma, urticaria, constipation, fatigue, epileptic seizures, eczema, etc.

2. Ingestion of estradiol and of progesterone, in one case, was followed in both instances by different symptoms, all of which had been commonly experienced by the patient at her menstrual periods previous to x-ray sterilization.

soon after the ingestion of progesterone at both tests with that hormone would also seem to be an allergic response rather than a physiological one, since progesterone did not lower the pulse in Mrs. M. One is reminded here of the lowered pulse at some menstrual periods in case C7, Mrs. E. B.

3. The difference in the allergic symptoms produced by the two hormones in Mrs. N. is not a novel phenomenon in food-allergic symptomatology. Dr. M. Murray Peshkin has described a number of instances in which different allergens caused different symptoms in the same individual (see also case J12, this report).

Discussion

The available literature dealing with "endocrine allergy" clearly indicates that typical allergic symptoms are sometimes due to a specific sensitivity to some of the individual's own hormones. The observed symptoms have been dermatoses (especially urticaria and acne), asthma, vasomotor rhinitis, angioneurotic edema and migraine.

Studies directed to the specific mechanism concerned in endocrine allergy have not clarified that question. Indeed, some of the reported observations seem contradictory and some seem incompatible with the theory, which we favor, that endocrine allergy is idioblaptic. Geber reported that his case of menstrual urticaria could be "desensitized" with her own serum, obtained at the time of her menstrual period, but not with the serum of a "normal" person. But the serum of normal women may contain equal quantities of sex hormones without a resulting urticaria. The difference between the normal woman and one afflicted with endocrine allergy is not in the relative quantity of the blood borne hormone but in the presence or absence of the specific sensitivity to it. Zondek and Bromberg describe passively transferable antibodies in some of their cases and identify them as similar to atopic reagins; while Baer, Whitten and Allen describe the cutaneous reactions as different from the classical types of immunologic skin reactions.

However, an outstanding feature of idioblaptic allergy is the most probable exclusion of antibodies as the specific mechanism of that category of allergic disease, and the constant failure of the

excitants of idioblapsis to produce specific cutaneous reactions in affected individuals.

On the other hand, certain clinical conclusions of Zondek and Bromberg are confirmed in our own study. They remark, "If it is true that premenstrual dysmenorrhea is connected with endocrine allergy, and in this respect differs from menstrual dysmenorrhea, the existence of a fundamental difference in the genesis of these two conditions must be regarded as probable." These authors found the cutaneous test to be positive in about 70 per cent of the cases of endocrine allergy, but negative in all cases of menstrual dysmenorrhea.

Again, they remark: "Thus, clinical pictures such as pruritus vulvae and various premenstrual disorders may, in part, be ascribed to allergic hypersensitivity to *different* endogenous hormones."

Their "positive" skin reactions to hormones in allergies beginning in the menopause (46 per cent) are not consistent with any theory of endocrine allergy. Such cases invite the pulse-dietary investigation.

Summary

1. Evidence is presented which indicates that idioblaptic allergy in women differs from that in men, as to symptoms, and as to the specific excitants.
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2. Ingestion of estradiol and of progesterone, in one case, was followed in both instances by different symptoms, all of which had been commonly experienced by the patient at her menstrual periods previous to x-ray sterilization.

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CHAPTER XXVII

*Allergy in Glaucoma**

Manifestations of Allergy in Three Glaucoma Patients as Determined by the Pulse-Diet Method of Coca

BY

CONRAD BERENS, M.D., LOUIS J. GIRARD, M.D., AND EDITH CUMMING, New York City

DURING THE past six years we have been conducting an investigation concerning the etiology of glaucoma, especially that of chronic simple glaucoma, in which ocular hypertension is not preceded by other demonstrable ocular pathology. The role of allergy as a possible predisposing factor in this disease, although receiving scant mention in the literature, seemed worthy of consideration. Previous reports[1, 2] have dealt with the probable role of bacterial allergy, especially of the upper respiratory tract, in the etiology of chronic simple glaucoma. However, the known methods of establishing allergies, particularly the food allergies, appeared too unreliable to warrant the inclusion of such a study. In 1945 our attention was brought to Coca's method[3] of determining allergy by the pulse rate. We also learned that an investigation of the role of allergy in the etiology of glaucoma by Coca and the late Mark Schoenberg had been interrupted by the death of the latter. Although the findings were incomplete, the preliminary results were sufficiently suggestive to justify a more extensive study, especially in view of the fact that glaucoma accounts for at least 12 per cent of blindness in the United States of America.

From the Department of Ophthalmology, New York University College of Medicine.
From a grant made by the Ophthalmological Foundation, Inc.
Read in the Symposium on Allergy of the Academy of Science, April 26, 1947.
* Reprinted by permission from *Ann. Allergy*, 5:526–535, November–December, 1947.

Difficulty was encountered in the selection of suitable cases. Because of the variability of the signs and symptoms of glaucoma, it was desirable that the patient should have been under our observation for a year or more prior to the allergy study and that he had remained so for at least a year after removal of the allergens. In order to evaluate the effect of the removal of any existing allergens from the diet, or the effect of environment upon the ocular condition, it was considered preferable that the affected eye should not have been operated upon prior to the study, or the tension should have been uncontrolled in spite of surgery. However, a progressive loss of visual fields in spite of apparently controlled tension offered a suitable basis for research. Two of the patients had been operated upon and the tension controlled but they continued to show a progressive loss of visual fields. The latter seemed to show improvement after the institution of an allergen-free diet. In the third patient, no operation had been performed and the tension was not controlled until food allergens were eliminated from the diet. It was essential that the patient have no coronary disease which might interfere with the interpretation of the pulse rate, that existing inhalant or contact allergens be suitably controlled, and, above all, that he be intelligent and painstakingly coöperative. Of fifteen patients with glaucoma, all of whom proved to be allergic by preliminary tests, only three met the specified requirements. All three patients discussed in this paper received autogenous bacterial antigens developed from their own upper respiratory organisms and were treated by a rhinologist, but their glaucoma was seemingly controlled only after their food allergies, as indicated by the pulse-diet method, received attention.

Case Report

Case 1. Miss J. L. was observed on May 28, 1945, at the age of 44. She had had some watering and burning of her eyes six weeks previously and had been to the Brooklyn Eye and Ear Hospital for treatment. It was there she was first told that a condition of "potential glaucoma" was present. She had no other eye symptoms. Her family history was negative, and past medical history uncovered only the presence of a chronic bronchitis (confirmed by roentgenogram) for several years.

Our examination showed: vision, right eye—20/25 correctable to 20/20 with +1.00D sph. +0.25D cyl. axis 90°; vision, left eye—20/30 correctable to 20/20

with +1.00D sph. +0.50D cyl. axis 90°. Accommodation was right eye—600 mm. print at 230 mm., and left eye—500 mm. print at 200 mm. The near point could be brought to normal with a +1.00D sph. added to the above correction.

External and slit lamp examinations revealed no pathologic lesions. Tension taken with a Schiötz tonometer was right: 14 mm. Hg, left: 34 mm. Hg taken with the 5.5 and 7.5 Gm. weights. Similar readings were found one hour later. Her visual field on the stereo-campimeter was normal. Roentgen examination of the patient's sinuses showed thickening of the mucous membranes of the left antrum and clouding of the sphenoids. There was bone absorption about the roots of her left upper central incisor and right upper lateral incisor.

She was seen by a rhinologist who confirmed the findings in the left antrum, ruling out sphenoid disease by irrigation, and in addition diagnosing the presence of a chronic tonsillitis.

Bacteriological studies revealed that toxic Streptococcus viridans was present in large amounts in the throat as well as in the feces. Brucellosis intradermal test was negative but the tuberculin patch test was strongly positive. Basal metabolic rate was minus 9. Her blood count was normal except for a hemoglobin of 76 per cent and a Schilling index of 10.5. Blood chemistry: urea, urea nitrogen, nonprotein nitrogen and cholesterol were above normal.

A buffered solution of pilocarpine 0.5 per cent was prescribed t.i.d. for her left eye, and weekly injections of an autogenous streptococcus vaccine. The tension in her left eye remained elevated on succeeding visits until August 6, 1945, when it was 19 mm. Hg in each eye. During the interim period she had received treatment to her sinuses, including penicillin locally, by the rhinologist. A visual field taken at this time revealed marked temporal constriction of the left field with a 1 mm. test object. The 2 mm. isopter was normal.

Reculture of the nose and throat on August 9, 1945, again showed toxic streptococci and in addition coliform organisms were found. A coliform vaccine was prepared and given in weekly injections. At this time it was reported that her left upper incisor had been removed and that the sinus infection was "under control."

Observation on October 22, 1945, revealed a change in the visual field of the affected eye. Central fields showed a baring of the blind spot with the 1 mm. object (Chart XVII) in spite of the fact that tension had remained within normal limits.

On December 13, 1945, repeat fecal cultures showed almost complete absence of coliform bacteria and 150,000 toxic streptococci per dry gram. Tension was normal. Chest roentgenogram revealed no disease.

On January 13, 1946, the patient was started on an allergy study using the pulse-diet method for determining food allergies.

A few days later the patient developed an acute upper respiratory infection which was followed by empyema of the left antrum. This was treated by the rhinologist and on January 25, 1946, he performed an antrotomy.

On February 19, 1946, she was placed on a non-allergic diet. The pulse-diet method had shown allergies to potato, cereals, sugar, milk, tomatoes and peanuts.

On March 25, 1946, her visual field again showed baring of the blind spot with the 1 mm. object but a definite improvement over that field taken in October.

Difficulty was encountered in the selection of suitable cases. Because of the variability of the signs and symptoms of glaucoma, it was desirable that the patient should have been under our observation for a year or more prior to the allergy study and that he had remained so for at least a year after removal of the allergens. In order to evaluate the effect of the removal of any existing allergens from the diet, or the effect of environment upon the ocular condition, it was considered preferable that the affected eye should not have been operated upon prior to the study, or the tension should have been uncontrolled in spite of surgery. However, a progressive loss of visual fields in spite of apparently controlled tension offered a suitable basis for research. Two of the patients had been operated upon and the tension controlled but they continued to show a progressive loss of visual fields. The latter seemed to show improvement after the institution of an allergen-free diet. In the third patient, no operation had been performed and the tension was not controlled until food allergens were eliminated from the diet. It was essential that the patient have no coronary disease which might interfere with the interpretation of the pulse rate, that existing inhalant or contact allergens be suitably controlled, and, above all, that he be intelligent and painstakingly coöperative. Of fifteen patients with glaucoma, all of whom proved to be allergic by preliminary tests, only three met the specified requirements. All three patients discussed in this paper received autogenous bacterial antigens developed from their own upper respiratory organisms and were treated by a rhinologist, but their glaucoma was seemingly controlled only after their food allergies, as indicated by the pulse-diet method, received attention.

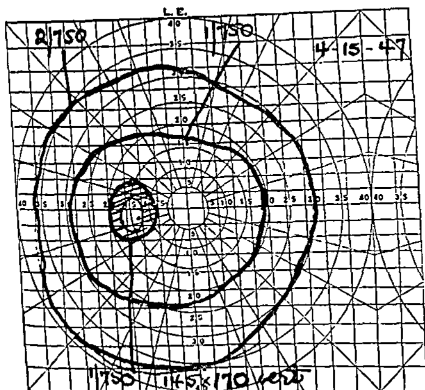
Case Report

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Our examination showed: vision, right eye—20/25 correctable to 20/20 with +1.00D sph. +0.25D cyl. axis 90°; vision, left eye—20/30 correctable to 20/20

brought under control by pilocarpine before the allergen-free diet was instituted. Her vision is and was approximately normal with slight fluctuations. Visual acuity is usually the last ocular function to be affected in glaucoma.

CHART XVIII



Left visual field of Mrs J. L., taken on April 15, 1947, showing improvement of 1 mm. isopter and no baring of the blind spot.

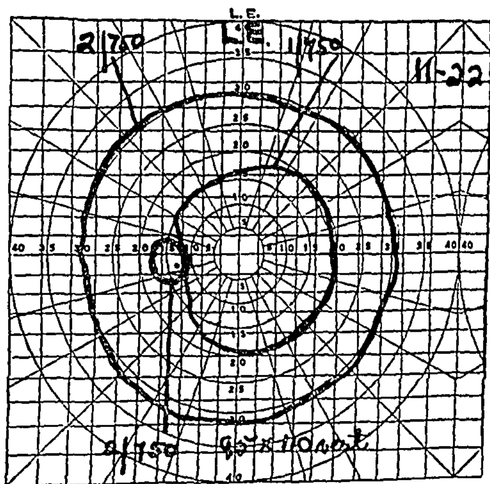
Two visual fields taken after going on the non-allergic diet were normal, whereas before the institution of the diet there was progressive constriction of the smaller isopters with baring of the blind spot. This was the most marked ocular improvement.

Associated symptoms of chronic constipation completely disappeared after the institution of the diet.

She was observed at monthly intervals from March to December with no particular change in the tension. Repeated visual fields remained the same.

On April 15, 1947, after an absence of four months during which time she remained on her allergen-free diet and received her autogenous streptococcus and coliform vaccines, her visual field showed improvement over previous fields. There was no baring of the blind spot in the left eye and the 2 mm. isopter was normal (Chart XVIII).

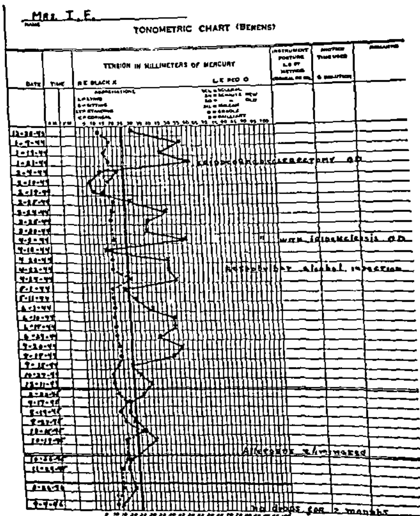
CHART XVII



Left visual field of Mrs. J. L., taken on November 22, 1945, showing temporal contraction of the 1 mm. isopter with baring of the blind spot; 2 mm. isopter is normal.

Follow-up and Highlights. This case is not so dramatic as the other two cases we shall report because the ocular condition before starting the allergy study was not so serious. Her tension was

CHART XIX



Tonometric chart of Mrs I E. Note that tension remained normal for one year after the elimination of allergens.

Case 2. Mrs. I. E., aged 46, was first observed on December 12, 1943. She had been treated four years previously for glaucoma of her right eye. She was complaining of sharp pain over her right eye.

Examination. Vision corrected, right eye—HM at 1 foot; left eye—20/15. The right eyelids were edematous and red, the bulbar conjunctiva was deeply congested. The anterior chamber was shallow, the pupil was dilated and fixed. There was typical glaucomatous cupping of the optic disc (8 diopters) and pallor of the nerve. Tension with Schiötz tonometer right eye 30 mm. Hg, left eye 12 mm. Hg.

Her visual field was reported as: right eye, light field at 2 inches, only small temporal field of perception nasally, above and below. Left eye, slight contraction above and below nasally with 1 mm. object. Absolute scotoma above the blind spot with 1 mm. object. Blind spot enlarged.

Roentgen examination of her sinuses revealed slight clouding of the ethmoids, and marked clouding of the left antrum with thickening of the mucosa. There seemed to be fluid in the right antrum. The sphenoids were cloudy, the right more than the left.

The rhinologist verified the fact that there was infection in the sinuses and advised sulfadiazine treatments by the Proetz method.

Hematology studies were reported as normal except for a high Schilling Index (38).

Cultures taken from the nose, throat and feces showed B. coli and Strep. viridans in the throat, and highly toxic (to *in vitro* tests) Streptococcus viridans in the feces.

A 2 per cent solution of pilocarpine was prescribed for the right eye q.i.d. and weekly injections of an autogenous coliform vaccine advised. She was treated simultaneously for her sinus infection.

In spite of this treatment, she returned two weeks later in acute distress with her right eye. Examination showed her tension had risen to 50 mm. Hg in that eye. She was treated in the office with pilocarpine 2 per cent and eserine packs. This failed to lower the tension perceptably and she was given a retrobulbar injection of 1 5 cc. of 2 per cent novocaine. Her tension dropped to 40 mm. Hg.

Within another two weeks her tension had again risen to 60 mm. Hg in her right eye and she was admitted to the hospital.

On January 21, 1944, under local anesthesia, an iridocorneosclerectomy was performed on the right eye. Postoperative recovery was uneventful Her tension remained subnormal for one month and then began to gradually rise Her visual field in the right eye taken on March 24, 1944, showed a small area of vision in the lower temporal field taken with the 20 mm object. Her light field was slightly larger. The left visual field was unchanged

During the next week her tension gradually rose in spite of increasing strengths of pilocarpine and eserine. On April 3, 1944, it was recorded as right eye—56 mm. Hg, left eye—19 mm. Hg. On April 4, 1944, iridocorneosclerectomy and iridencleisis were performed. Following this procedure the tension in her right eye stayed down only two weeks and again rose to 47 mm. Hg, necessitating a retrobulbar injection of alcohol. Her tension fell to normal (23 5 mm. Hg) but during the next month demonstrated a progressive rise and remained high but the eye was not painful. The tension remained high for several months and then fell to normal.

CHART XIX

Mrs. I. E.

TONOMETRIC CHART (BERENS)

TENSION IN MILLIMETERS OF MERCURY

R.E. BLACK X L.E. RED O

DATE | TIME | INSTRUMENT POSTURE | MIOTICS TIME USED | REMARKS

Iridencleisis iridectomy O.D.

Iridencleisis O.D.

Retrobulbar alcohol injection

Allergens eliminated

No drops for 12 months

Tonometric chart of Mrs. I E. Note that tension remained normal for one year after the elimination of allergens.

In October, 1915, her tension again began to rise, this time not only in the almost-blind eye, but in the good left eye as well. (Right eye—34 mm. Hg, left eye—32 mm. Hg.) Her visual field at this point was reported as: right eye—small seeing area with 20 mm. object and light temporally; left eye—temporal contraction of the 1 mm. isopter with baring of the blind spot.

In an effort to determine the cause of the continuing hypertension and contraction of the visual fields and thereby retain the vision in the left eye, allergy studies were made by the pulse-diet method of Coca. Major food allergies were found to be: chicken, peas, beans, peanuts, lettuce, wine, eggs, cauliflower, cabbage, brussel sprouts and broccoli.

Two weeks after being placed on an allergen-free diet, this patient's tension, using the same strength of pilocarpine, taking the tension at the same time of day and after the same post-miotic interval, was recorded as within normal limits (right eye—25 mm. Hg, left eye—25 mm. of Hg). Five weeks later the tension was right eye—17 mm. Hg, left eye—20 mm. Hg.

She was not observed again until September 4, 1946, when after using no pilocarpine for two months previously, her tension was right eye—16 mm. Hg; left eye—13 mm. Hg. Vision was right eye—HM; left eye—20/15 with correction.

Follow-up and Highlights. This patient had glaucoma of both eyes with uncontrolled tension in her right eye in spite of repeated operative intervention and intensive medical therapy. There was beginning hypertension in the left eye. Following the institution of an allergen-free diet, the tension became normal in both eyes even after cessation of all medication (Chart XIX).

Associated allergic symptoms were severe gastrointestinal distress and chronic constipation. Within two weeks after adhering to the allergen-free diet and without the customary cathartics, the patient's elimination was normal for the first time in the patient's memory.

It is a recognized fact among most ophthalmologists that emotional stress or worry has a direct effect on the ocular tension of the glaucomatous patient. In this particular case, at least some of the tension rise during the stormiest period could be attributed to the patient's worry over, and subsequent loss of her brother (about the time of the retrobulbar injection). Another similar experience would be expected to have a similar result, yet, during 1946, while on her allergen-free diet, the patient went through a severe emotional and physical experience involving the near fatal illness of her only son. With special permission from the Navy Department she nursed him eight to ten hours a day for three months. At no time did her eyes bother her, nor was there any rise in ten-

sion in spite of not using miotics. Since glaucomatous patients usually are as dependent on miotics as diabetics are on insulin, it was a good test of the possible benefit resulting from the allergen-free diet.

Case 3 Miss E. H., aged 67, a retired school teacher, was examined on March 3, 1941 On her first visit her vision was right eye—20/100 correctable to 20/20 with +2 25D cyl. axis 100°; left eye—20/100 correctable to 20/20 with a +2 25D cyl. axis 85°. With a +2.50D added to the above correction, she could read 400 mm. print at 290 mm. with each eye. Her tension was recorded as right eye—40 mm Hg; left eye—26 mm. Hg with the Schiötz tonometer and a 7.5 gm. weight. The anterior chamber of each eye was shallow, otherwise the external examination was normal. Both lenses showed finely granular cortical opacities.

Her visual field was recorded as right eye—slight enlargement of the blind spot, slight concentric contraction with 1 mm. test object, and slight contraction for all colors; left eye—enlarged blind spot and temporal and inferior contraction with 1 mm. test object.

Her general physician reported a right radiculitis and a hypertrophic cervical arthritis.

Laboratory studies revealed a moderate secondary anemia with a sedimentation rate of 18 mm. per hour and a Schilling Index of 62. Cultures from her nasopharynx demonstrated numerous toxic hemolytic streptococci and Streptococcus viridans.

The patient was placed on pilocarpine 2 per cent b i.d for her right eye and hot compresses and massage for both eyes. Under this regime her tension came down and remained within normal limits for seven months During this time she had no pain but complained of attacks of blurring of vision in her right eye. Her visual field remained approximately the same and she was placed on an autogenous streptococcus vaccine.

On November 10, 1941, she complained of acute pain in her right eye following a severe cold Her vision in the right eye was 3/200; her tension was right eye—44 mm. Hg; left eye—14 mm. Hg with the 7.5 gm. weight. Her last pilocarpine drops had been taken only two hours previous to the examination. Under the slit lamp the cornea showed clouding and the iris was congested.

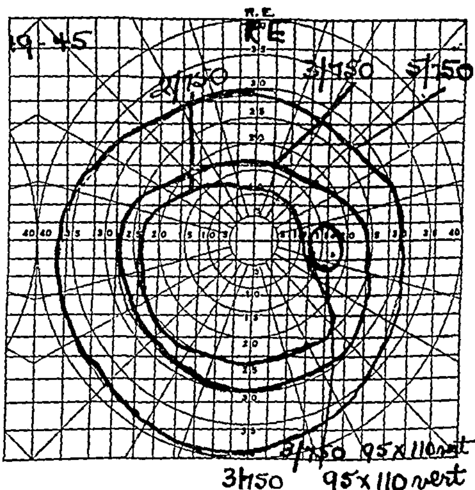
She was placed in the hospital and an iridocorneosclerectomy performed that same day. Her postoperative recovery was good but her corrected vision in her right eye was reduced to 20/100. She was observed periodically during the next two years Her tension remained normal but her vision continued to be poor in the right eye. Repeated visual fields continued to show contraction of her right field Toward the end of this period her vision began to fail (going down to 20/200 in her right eye) and there was progressive contraction of her visual fields

At this point (September, 1945), the patient was investigated for possible food allergies These studies covered a period of approximately two months. The pulse-diet method revealed the following major allergens: wheat, all cheese, oatmeal, coconut, pork (including jello with a pork base), vinegar and citrus fruits and Lavoris. Questionable allergens included beans, milk, lettuce, V-8 vegetable juice, the apricot family and coffee.

The patient claimed subjective general and visual improvement soon after she was placed on the allergen-free diet.

Her last field before starting the allergen-free diet was taken on October 19, 1945. It was similar to those taken previously showing upper temporal loss in all isopters and baring of the blind spot (Chart XX).

CHART XX



Right visual field of Miss E H., taken on October 19, 1945, showing marked temporal contraction of all isopters and baring of the blind spot.

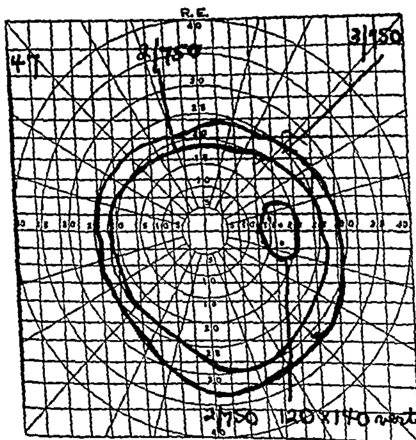
In November, 1945, there was definite improvement in the visual field of the right eye for the 3 mm. isopter and slight improvement in the 2 mm. isopter.

Six months later, June, 1946, the improvement was even more marked, 2 and 3 mm. isopters had filled out and there was no longer a baring of the blind spot.

The last field taken on this patient was on February 14, 1947 (Chart XXI) and was the most normal field taken since the onset of the patient's glaucoma.

Follow-up and Highlights. The patient was placed on her non-allergic diet on December 20, 1945. *On January* 4, 1946, her vision in the right eye was 20/200, but on January 31, 1947, it had

CHART XXI



Right visual field of Miss E. H., taken on February 14, 1947, showing normal 2 mm and 3 mm. isopters and no baring of the blind spot.

risen to 20/100 and it has remained at this point up to the present in spite of an increase in density of the cataract in that eye.

The field taken on June 6, 1946, six months after initiating the allergen-free diet showed a definite improvement over the previous fields. This was an unusual finding since loss of visual fields as-

sociated with optic nerve damage is usually irreversible. The most that can be hoped for usually is the maintenance of the field without further loss.

Fields were taken on February 14, 1947, and further improvement over June was noted.

It is important to state that the technician who took these fields was the same one who had previously taken them during the two-year period when a progressive loss was observed. Also, the tests were standardized as to lighting (7.5 foot-candles), the size of the test objects, and other factors.

It was also interesting to note that other allergic symptoms, *i.e., chronic rhinitis, coughing attacks after meals*, eczema, chronic constipation with flatulence and gastrointestinal distress, and neuralgic pains in the neck and face were no longer complained of after the institution of the allergen-free diet.

It may be mentioned that in July, 1945, this patient made application for assistance in learning Braille and for entering a home for the blind. Her psychologic reactions have so improved that she has now abandoned these ideas.

Summary

Three cases of chronic simple glaucoma have been presented in which the usual treatment with miotics and attempted desensitization with autogenous bacterial antigens had been supplemented by the removal from their diets of food allergens, as determined by the pulse-diet method. In one case, the hitherto uncontrolled tension was brought under control apparently only after the institution of an allergen-free diet. In the other two cases, surgery and medical treatment controlled the glaucomatous hypertension but failed to check progressive loss of visual fields. The latter showed marked improvement after the institution of an allergen-free diet.

In view of the many uncontrollable factors involved in the treatment of glaucoma from the psychological, medical and ocular viewpoints it is inadvisable to draw definite conclusions. However, because of the suggestive findings in these cases, it was thought warranted to report them with the hope that the possible role of allergic factors in glaucoma will be investigated by others

and the effect of anti-allergic treatment of this most serious disease will receive final evaluation.

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Author Index

Subject Index

This Book

Familial Nonreaginic
FOOD-ALLERGY

By Arthur F. Coca, M.D.

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